A COMPARATIVE STUDY OF BUSINESS MODELS OF INDIAN LIFE SCIENCES BUSINESS PROCESS OUTSOURCING INDUSTRY

ABSTRACT OF THE THESIS

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BY

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ABSTRACT

INTRODUCTION

Globalization has been defined by many authors in a variety of ways due to the varied approaches their definitions are based upon, such as economical, political, financial, technological etc.,. One common thread that comes out of the various definitions that exist for globalization is that globalization is primarily an economic phenomenon, involving the increasing interaction or integration of national economic systems all over the world through growth in international trade, investment and capital flows.

Advances in information technology, specially internet technologies has contributed very significantly to enable worldwide real-time interconnectedness and these technology based innovations and advances have triggered the process of achieving competitive advantage by businesses across the globe, irrespective of the size, nature of business or the geographical location/s of these organizations. In other words, the reality "Globalization forces everyone to compete with the cheapest producers" is brought into stark focus (Friedman, 2006).

To a business leader, this means that there are more challenges than ever from stakeholders such as competitors, customers, investors and regulators. The business also needs to survive, grow revenues, become more agile in the face of competitive and market pressures and provide customers with optimum service. One of the best ways to achieve this is through globalization of the organization. Successful businesses are responding to this phenomenon of "global competitiveness" by optimizing their "business services" through outsourcing and hence attain a differentiation leading to a competitive advantage, from the business perspective.

Outsourcing, primarily involves transferring ownership of an organization's business processes and activities to a external service provider. For a fee, the outside service provider carries out the activities and maintains responsibility for their outcomes (Chamberland, 2003). Creating value for a business in today's markets means transforming the organization into a focused, responsive, variable and resilient business and can primarily be achieved through the Business Process Outsourcing (BPO) Model.

In this study, the focus is only on outsourcing of business processes leading to optimization in the Life Sciences industry. The term Life Sciences includes the biomedical, biotechnology, medical devices and the medical diagnostic industries. The generic model framework being evolved in this study creates and implements an effective model that predicts the essential, elemental critical success factors and their relationships which affect business performance of organizations in the Life Sciences BPO Industry.

It has become evident through the literature that over the past decade, biomedical and life sciences companies have entered a difficult period where shareholders, the market and regulators have all created significant pressures for change within the industry. From thinning product pipelines and skyrocketing operating costs to calls for lower prices and a greater regulatory burden, the industry is confronting unprecedented challenges that are expected to radically transform the business.

In an atmosphere of declining research and development (R&D) productivity, mounting pricing pressure and changing regulatory requirements, global biomedical and life sciences companies face increasing challenges to achieve and maintain profitable growth. (PwC, 2006). Global biomedical business process outsourcing offers life sciences organizations an opportunity to overcome these challenges.

Motivation for this Research

Although global biomedical business process outsourcing seems to offer life sciences organizations an opportunity to overcome its inherent problems or challenges, understanding the elements and organization structures which control and hence influence the final outcome of this process become very critical. In other words, understanding the elements of the business process outsourcing (BPO) business model, their influences and their relationships can help us predict the effect of the business models on the organization's business performance.

Even though the concept of business model is potentially relevant to all firms, a search of the organization, economic, and strategy literatures, resulted in finding a few articles on the subject, and just one largescale empirical study (Amit and Zott, 2001). Although several authors have provided useful frameworks for analyzing

businesses. such as profit models (Slywotzky. et al. 1997) and strategy maps (Kaplan and Norton. 2004) these approaches are based on a tradition of classifying firms into "internally consistent sets of firms" referred to as strategic groups or configurations (Cool and Schendel. 1987). These groups—typically conceived and organized through the use of typologies and taxonomies (Miles and Snow. 1978) were often used to explore the determinants of performance. None of these authors provided any insight on the biomedical outsourcing elements. typologies. taxonomies and their effects on business performance/success.

There have been very few large-scale systematic empirical studies in the area of understanding the effect of business models on business performance and success in the Indian Life Sciences BPO industry. We do not know. for instance. how common different kinds of business models are in the economy and whether some business models have better financial performance than others.

This brief summary of related literature has motivated this research and this study provides a first attempt to answer these basic questions about business models and their effect on business performance and success in the Indian Life Sciences BPO industry. The research provides a theory-grounded proposal for understanding the effect of business models on business performance and success primarily through an empirical approach. Specifically. the researcher is interested in answering the primary question of whether business models have performance implications.

LITERATURE REVIEW

This research study is part of the new research stream on business models and focuses on a specific area not covered so well until now: specifying. conceptualizing business models. understanding the effect of business models on business performance. Most business model research stays at a non-conceptual. broad and sometimes even vague level and hence this work tries to dig into the details and define a generic model to describe business models and their effect on business performance / success. This approach becomes indispensable if one wants to provide effective business model framework to improve. manage business performance/success in a rapidly moving. complex and uncertain business environment of the Life Sciences BPO industry domain.

Based on the above, a partial outcome of this research is a generic business model framework specific to the Life Sciences BPO industry that ideally represents the foundation for designing and developing new management tools for business performance assessment and business strategy.

A summary of the literature review is presented below :

Literature review summary

Authors	Summary	Study Objectives
Mintzberg (1979); Silverman. 1999);	Concept of Strategy and its effect on Businesses	Background of Business Models
Prahalad and Bettis (1986): Tushman and O'Reilly. (1997);	Manager path dependent behavior of business performance	Direction of research on Business Models
Chesbrough & Rosenbloom (2002);	Business model (BM)as a construct	Existence of Business Models
Genesereth and Nilsson (1987): Malone et al., (2006)	Definition of a business model	Definition of Business models
Timmers (1998); Amit & Zott(2001); Magretta. (2003): Grasl. (2008):	Importance of the business model for business performance and success	Business models affect business performance
Slywotzky et al., (1997) Kaplan et al., (2004);	Influence of business models on business performance	Business models and business performance
Chesbrough and Rosenbloom 2000; Pateli and Giaglis 2003; Rentmeister and Klein (2003)	New modeling methods in the domain of BM	Modeling methods in the domain of Business Models
Dess and Robinson (1984)	Conceptual framework and valid measures to organizational performance	Study approach
March and Smith (1995); Alan M. Rugman and Alain Verbeke. (2000);	Process for creation of a generic business model framework & constructs	Identify generic business model framework approaches
(Rockart and Bullen. 1986); Spector; (1992) Umble et al., (2003)	Critical Success Factors and identification.	Identify elemental critical success factors
Rappaport. (1986):Copeland. et al., (2000);	Market-based measures -the best possible measures	Best possible measures of organization performance
Ball and Brown (1968); Robinson (1995)	Return to stockholders provided the most power	Selection of RTS as business performance indicator

Based on literature review, it becomes clear that there exists a relationship between business models and business performance of organizations. Hence determining a specific business model configuration for the specific organization in a specific industry becomes critical for its survival and success.

It is also evident that there are no industry specific models, frameworks, tools which can be applied to create a business model, study effects of varying individual components on business performance and comparing different organizations with their own unique business models. Hence there is a dire need to create an industry specific generic business model framework which can predict business performance of an organization. This should also provide an option for studying the effect of the model on performance when constituent business model variables are manipulated.

RESEARCH METHODOLOGY

This part describes the methods and procedures used to identify existing, common business model design elements and their relationships with reference to the external environment, identify and evaluate Critical Success Factors (CSF's), conceptualize and create an empirical generic / reference business model reflecting their relationship and effect on industry performance.

It describes how this generic / reference business model forms the basis to further compare the effect of business model designs on business performance of firms. It also describes the methods used to collect data for use in answering the research questions and testing the research hypotheses. Finally, the chapter ends with an overview of the data analysis methodologies used to test the research hypotheses.

Research Gap

On completion of literature review, it became evident that there was a dearth of studies which look into the effect of business models on business performance in the Life Sciences Business Process Outsourcing (BPO) Industry domain. There was also no evidence of research which have studied the effect of business models on business performance in the Indian Life Sciences Business Process Outsourcing(BPO) Industry context.

To fill the existing knowledge gap and satisfy this unmet need, this research study focuses on understanding the effects of business models on business performance in the Life Sciences Business Process Outsourcing (BPO) Industry domain and construct a industry specific generic business model framework which can predict business performance in this specific business domain.

Research objectives

As previously indicated, very few rigorous empirical studies have been conducted to investigate how business models affect business performance and success, and how business model related elemental variables (Critical Success Factors - CSF) influence this effect. Hence, the primary purpose of this study is:

- To increase understanding of how business models can be constructed through the examination of its underlying processes
- To increase understanding of the relationship between business models and business performance/success by taking into account elemental variables (Critical Success Factors - CSF) associated with the business model.

To achieve this purpose, the following major research objectives are addressed:

- Identify, constituent elemental critical success factors of business models in the Life Sciences BPO industry using survey questionnaire instrument through multiple pilot studies.
- Identify a set of themes to classify the above identified constituent elemental critical success factors of business models and operationalize them.
- Propose or construct a generic business model framework based on the identified constituent elemental critical success factors and their relationships affecting business performance.
- Identify a business performance and success outcome measure that relates to organizational performance.
- Using the constructed generic business model framework identify and compare business model relationship to business performance of identified Indian Life Sciences BPO organizations.

- Test association of the relationship between proposed business performance values and factual business performance and success values obtained from the above objective.

Accomplishing these research objectives is expected to contribute both to practitioners, by providing guidelines for creating business models which will enhance business performance/success; and to academic research by providing insight, and direction for future research.

Since, research has the ultimate of developing an organized body of scientific knowledge, this research study is being undertaken in order to gain new knowledge and add to existing knowledge through a documented, data-driven approach to the development of scientific knowledge.

Research Questions

Given the pervasive reference to business models in the industry and the dearth of rigorous study on the subject, the researcher believes that research on business models and how these affect and enable organizations to achieve improved performance results under different conditions can contribute greatly to the current body of knowledge. Although this research seeks to represent the proof of causal relationships between business models and business performance/success, it does not attempt to answer deeper questions about why the performance implications exist.

Based on the above, one primary research question to be addressed in this research is :

- How does business model design affect business performance in the Life Sciences BPO domain ?

This primary research question in turn gets translated into four sub-questions as follows:

- What are the existing business model design elements in the Indian BPO context ?
- How can business models be described and represented in order to conceptualize, define and build reference or generic business model framework ?

- Can this generic business model framework be used to identify and compare existing business models OR Can an efficient business model design be determined by comparing models of different Indian BPO firms ?
- How can a specific business model with value constellations be built for the BPO domain ?

Research Hypotheses

To achieve the objectives of this research, the following initial hypotheses were investigated. These hypotheses were developed based on the requirement of the study in answering the research question/s.

- Null hypothesis (H_0) : An organizations' business performance is independent of its business model.
- Alternate hypothesis (H_A) : An organizations' business performance depends on its business model.

Due to dearth of research studies, the research was designed in such a way that on identifying elemental CSF's, themes and exposing the respondent data set to exploratory factorial analysis, working hypothesis could be formulated depending on the factor solution obtained after EFA. Based on the obtained four factor solution (post EFA), we arrived at the following set of working hypothesis (Null(H_{0n}) and Alternate (H_{An}) where n = 1, 2.....x) :

- H_{01} : An organizations' business performance is independent of "Customer Factor".
- H_{A1} : An organizations' business performance depends on its "Customer Factor".
- H_{02} : An organizations' business performance is independent of "Organization Factor".
- H_{A2} : An organizations' business performance depends on its "Organization Factor".
- H_{03} : An organizations' business performance is independent of "Industry/Sectoral Factor".

- H_{A3} : An organizations' business performance depends on its "Industry/Sectoral Factor".
- H_{04} : An organizations' business performance is independent of "Environmental Factor".
- H_{A4} : An organizations' business performance depends on its "Environmental Factor".

Since the study was designed to compare two rank variables to measure the strength of association between business models and business performance, or lack of it, the following working hypothesis was also tested.

- H_{05} : There is no association between model based ranks and RTS based ranks of an Indian Life Sciences BPO organization.
- H_{A5} : There is association between model based ranks and RTS based ranks of an Indian Life Sciences BPO organization.

Research Design

There is limited research that have studied the relationship between business models and business performance and success, especially in the Life Sciences BPO industry domain. Based on this, the study was designed to start with an initial limited exploratory design (LED) phase and then move into the conclusive research design (CRD) phase. The empirical investigation through survey research was intended to improve generalizability of the analysis of the interrelationship between business models and its impact on business performance.

The initial, limited exploratory research design (LED) phase was adopted due to the need for rich data that could facilitate the generation of theoretical categories that could not be derived satisfactorily from existing data (Locke, 2001). In the LED phase secondary data was utilized initially to identify at least some of the elemental CSF's. Since this identified very few elemental CSF's, it was followed with collection of primary data through five pilot studies.

Data from this stage was used to identify elemental critical success factors (CSF) of business models in this domain and categorize them into themes. This formed the basis for creating the survey instrument which was used in the next stage of the study

(large scale research survey). The final survey instrument with 46 elemental CSF's and 8 themes was arrived at after content validity and reliability analysis.

In the CRD phase, the causal research design was utilized to collect primary data through a large-scale research survey. Data was collected using a web-based survey questionnaire response system through organizational informants who participate in their organization's outsourcing initiative in various roles. Based on data obtained through this large scale survey, the 8 themes with their constituent elemental CSF's were reduced using exploratory factor analysis (EFA) to yield a more manageable four factor solution based on the relationships between these elemental CSF's.

The study was also designed to collect business performance metric data in the form of returns to shareholders (RTS) which was calculated from organization specific financial data collected using secondary sources. This business performance data and the four factor solution were used to construct a generic business model framework for Life Sciences BPO organizations.

The last and final Comparative study phase of this study was designed so that, primary data was collected through a limited survey using a set of respondents (working in Indian BPO/CRO Organizations) who were different from those who took part in the large scale research survey study.

Based on total respondent scores, arrived at after applying the individual four factor loading scores to individual survey instrument response, different business models were identified. In summary, 33 business models were identified and organizations were ranked on the total respondent score. Applying the generic business model framework on these 33 identified business models individually, yielded an organization specific business performance metric (predicted RTS). This organization specific predicted RTS value was used to compare the participating Indian Life Sciences BPO organizations. On completion of this phase a total of 21 unique business models were identified and compared.

In the final step, organization specific financial data from secondary sources which quantifies the identified business performance measure RTS were collected for the above specified Indian companies. The predicted RTS and the actual RTS were also analyzed for any association to determine the robustness of the proposed generic business model framework.

Population and Sample

The primary objective of this research is to evaluate the impact of Life Sciences BPO industry Business Models on business performance; therefore, outsourcing professionals from Business Outsourcing functions (Customers as well as service providers) at the organizational level are appropriate subjects. These participants are assumed to have direct experience with business process outsourcing and possess knowledge about their organization and service provider/customer performance. Based on these assumptions, the target respondents included in this research were selected so that they satisfied the above.

The selection criteria were defined to ensure that respondents have the best knowledge about the Life Science outsourcing industry and have direct experience with the outsourcing function and hence were capable of providing useful inputs. Further, as this research aimed to develop a measurement instrument that could be applied in to either private or public organizations, no restriction in types of organizations were applied.

Since there is no readily available database for this population, the purposive sampling frame was originally set to Life Sciences outsourcing organizations across all geographies. Considering the sample size required, costs and disadvantages of postal survey, it was decided that an electronic survey would be more appropriate, given that the target respondents would all have internet access.

The e-mail addresses of the respondents who satisfied the indicated criteria were identified online primarily on the LinkedIn Professional Group "Life Sciences Outsourcing" through the researcher's networks and several outsourcing online networks in LinkedIn to provide the required sampling frames for this study. All the professional groups selected in this study to complete the sample frame had specific entry gate criteria. For example, the LinkedIn group Life Sciences Outsourcing is a regulated group which has an entry gate criterion in the sense that this is an exclusive group for professionals in the outsourcing industry and has around 1495 members.

In summary, the final samples comprised of organizations worldwide and included members of online forums and members of researcher's networks who have the best available knowledge of the life science outsourcing industry and have direct experience with the outsourcing function in the life sciences industry.

Data Collection Procedure

Elemental CSF Study Data Collection : In total, 2857 invitations were sent out to a much focused sample frame and at the end of the survey window, 347 responses were submitted/received. The response rate was 12.15% considering that some of the respondents preferred not to participate or would not have received the e-mail itself due to an active/enabled spam filter in their e-mail program.

243 (71.67%) out of 347 received survey responses were considered for the analysis. This data was then analyzed using exploratory data analysis (qualitative) techniques and exploratory factor analysis to arrive at a four factor solution. This four factor solution identifies elemental critical success factors (CSF's), corresponding themes of these CSF's and their relationships which influence or affect business performance of Life Sciences BPO organizations.

Business Performance Parameter Data Collection : Out of the 243 useful responses received, a total of 117 respondents had indicated either the division in which they were working and or the organization to which they were affiliated. A total of 28 Customer organizations and 18 service provider organizations were selected from the above based on specific collection criteria, for this stage of data collection.

After selection of the organizations, factual secondary financial data were collected from standard financial resources, financial websites and the specific organizations' website to arrive (calculate) at the business performance metric – Returns to shareholders (RTS) value for the specific organization.

This data was then analyzed using quantitative data analysis techniques (multiple regression analysis, Analysis of variance (ANOVA)), to construct a generic business model framework. This constructed framework depicts the identified essential elemental critical success factors (CSF's), their internal relationships and the effect or influence or relationship of these identified CSF's on the business performance metric returns to shareholders (RTS).

Comparative Study Data Collection : Based on the four factor solution arrived at, after exploratory factor analysis (EFA), a second questionnaire was created by utilizing elemental critical success factors identified. This questionnaire was sent to pre selected organizations and respondents working in those specific organizations.

In total, 45 invitations were sent out to a much focused sample frame and at the end of the survey window, 36 responses were submitted/received. The response rate was 73.35 % as only 33 of the received responses were considered usable since 3 incomplete responses were lost to follow-up. The response rate for this survey is high due to the fact that the sample size was small and there was a vigorous follow-up through personal calls to ensure the survey was completed and returned.

Based on total respondent scores, arrived at after applying the individual four factor loading scores to individual survey instrument response, 33 different business models were identified. Applying the generic business model framework on these 33 identified business models individually, yielded an organization specific business performance metric (predicted RTS). This organization specific predicted RTS value was used to compare and create a ranked list of participating Indian Life Sciences BPO organizations.

Of the 33 business models identified, 21 were unique business models in the sense that they had unique respondent scoring values. From the above data the 21 unique business models were analyzed to determine an association between generic business model framework predicted business performance (RTS) and actual business performance based on factual RTS (organization specific financial data from secondary sources).

Survey Instrument Development

Generally accepted principles of instrument design was used in this research to develop measures of Business Model Elements so that the survey instrument so generated could identify the critical success factors for India based Life Sciences BPO industry and their relationship to business success or performance. The general six steps procedure laid out by Hinkin (1998) was followed for development of the instrument.

Based on literature survey an initial one hundred and twenty one (121) items/categories/components and twenty six (26) significant themes were identified. To validate these identified significant themes and items / categories / components, multiple survey based pilot studies were undertaken. By grouping similar items/categories/components and applying the method of "Critical Success Factors

(CSF)" (Rockhart, 1979; Rockhart, 1981; Richard, 2004) on data obtained from the above studies, fifty two (52) items / categories / components / "Critical Success factors (CSF)" (initial survey items) were identified. The CSF's so identified were content analyzed to identify and categorize them under eight (8) significant themes/"Sources of CSF" to guide the development of individual survey items.

In the final stage, the content and reliability of scales were evaluated through content validity assessment and reliability analysis. The final survey instrument consists of eight (8) Source of CSF's (significant themes) namely : Strategy, Human Resources, Operations, Marketing, Finance, Environment, Industry and Innovation. Under these Source of CSF's, a total of forty six (46) Critical Success Factors (business model elements) are included. Source of CSF – Strategy includes 8 CSF's. Human Resources includes 5 CSF's, Operations 3 CSF's. Marketing 7 CSF's. Finance 7 CSF's, Environment 6 CSF's, Industry 6 CSF's and Innovation 4 CSF's.

DATA ANALYSIS AND DISCUSSION

This study has utilized the techniques of descriptive statistics, validity testing, reliability testing, exploratory factor analysis, regression analysis and tests for hypothesis. Microsoft Excel 2007 was used for initial data collection and data cleaning. Statistical software program SPSS17.0 for Windows was employed to analyze the data collected in this study. As indicated previously, analysis was performed on 243 usable respondents' data out of the received 347 responses from 2857 participation invites sent to potential respondents. This data was used to identify and thematize elemental CSF's into themes and reduce them to arrive at a more manageable four factor solution using Exploratory Factor Analysis.

Business performance metric RTS was then calculated for 46 Life Sciences BPO organizations and multiple regression analysis procedure was used to construct the generic business model framework. Based on comparative study respondent scoring, and applying the generic business model framework, various, existing business models were identified, compared and ranked accordingly. Spearman's rank correlation procedure was used to finally test the association between predicted RTS value(from the model) and factual RTS values of organizations which would also test robustness of the proposed generic business model framework.

Out of the 243 respondents, 7% constituted BPO Service Providers (Service providers providing BPO services), 28% CRO (Clinical Research Organization) Service providers (Service providers providing CRO services), 24.3% BPO Customers (characterized as respondents who require BPO Outsourced services) and 40.70% of CRO Customers (characterized as respondents who require CRO Outsourced services).

Methodology used in the survey, to identify critical success factors that affect business performance were based on a 5-point scale with preset response possibilities. The weighted average for each element under Critical Success Factor Themes were arrived at to understand the importance of each elemental critical success factor under a specific CSF theme (eg : Elemental CSF "Physical Infrastructure" under the theme "Strategic CSF's") and their relationships if any.

Average of CSF themes ranked by degree of importance

SL.	Critical Success Factors	WEIGHTED AVERAGE
1	OPERATIONS	4.10
2	INNOVATION	4.05
3	STRATEGY	3.92
4	FINANCE	3.88
5	HUMAN RESOURCES	3.86
6	MARKETING	3.68
7	ENVIRONMENT	3.67
8	INDUSTRY	3.52

On summarizing, the weighted average of all theme critical success factors. Operations with a weighted average of 4.10 stands out as the most important CSF theme essential for business success. Next comes Innovation with a weighted average of 4.05 followed by Strategy with a weighted average of 3.92. The effect of industry related elemental CSF's have the least effect on business success.

In conclusion, elemental success factors under the CSF Theme Operation and Innovation (GROUP 1) influence business success of Life Sciences BPO industry to a maximum extent respectively. Strategy, Human resources and Finance CSF themes (GROUP 2) in that order, are the next group of theme CSF's which influence business success in this industry to a large extent when compared to CSF themes Operation and Innovation.

Marketing and Environment theme CSF's (GROUP 3) form the third group of theme CSF's which affect business success in this industry. In terms of their quantitative influence, they lag behind Strategy, Human resources, Finance CSF themes and Operation. Innovation themes.

The Industry CSF (GROUP 4) theme is quantitatively the least influencing theme on business success when compared to Marketing, Environment theme CSF's, Strategy, Human resources, Finance CSF and Operation, Innovation themes. Figure 4.16 given under Annexure VI helps us visualize the grouping of theme CSF's based on their weighted averages.

In summary, we can conclude that the 46 elemental CSF's can be grouped into 8 Theme CSF's and based on qualitative analysis we can further categorize them into four groups based on their quantitative influence on business success of the Life Sciences BPO industry. The quantitative influence of each theme CSF is arrived at by considering their weighted average. Based on this we can create a qualitative or exploratory model which depicts the effect of CSF's on business success, through a cause and effect diagram (Figure 4.a) which would help visualize the critical success factor themes, the most important elemental CSF's under a specific theme, their relationships and their weightages in affecting business success in the Life Sciences BPO Industry.

Exploratory Factor Analysis

The next step in data analysis was to discover simple patterns in the pattern of relationships among the Critical Success Factor variables and in particular, seek to discover if the observed variables can be explained largely or entirely in terms of a much smaller number of variables. According to Kline (1994), Factor analysis consists of a number of statistical techniques the aim of which is to simplify complex sets of data and in social sciences factor analysis is usually applied to correlations between variables.

Principal component analysis (PCA) was used for factor extraction to obtain estimates of the initial factors that account for the largest variance in the sample. Table 4.20 shows the initial statistics generated for the candidate critical success factors. The rule used to finally determine the number of factors to include was Kaiser criterion (all

factors with eigen values greater than one) (Kaiser, 1974) and the scree test. For the critical success factors this resulted in a four factor solution which explains 100.00 percent of the variation. Subsequently, varimax rotation with Kaiser normalization was chosen as the method of transforming the initial factors into a more meaningful configuration.

Factor loadings resulting from the varimax rotation were evaluated using the threshold of 0.35. level recommended by Churchill (1979). Only items with factor loadings of 0.35 and above were considered to be included under each of the factors of the four factor solution.

Based on results from the above procedure, and by logically grouping the identified critical success factors under the four factor solution we can name the identified four factors as Customer Factor (Factor Score : 22.039), Organization Factor (Factor Score : 11.109). Industry/Sectoral Factor (Factor Score : 4.097), Environmental Factor (Factor Score : 0.788).

Out of the 243 useful responses received, a total of 117 respondents had indicated either the division in which they were working and or the organization to which they were affiliated. A total of 28 BPO and 18 CRO service provider organizations were selected and ranked from the above 117 respondents for this stage of data analysis – for calculating the RTS value for specific organisations. RTS value was calculated using the standard formula [Return on share holder's investment = {Net profit (after interest and tax) / Share holder's fund} × 100] for individual organizations.

Based on ranking of the organizations considering their RTS value, it is evident that BPO organizations are better performers than the CRO organizations in terms of RTS. The top 11 rankings consecutively in the above table are for BPO organizations followed by 10 CRO's and subsequently, 13 BPO's have a consecutively higher rank compared to 5 CRO's in terms of their RTS value.

Generic Business Model Framework

On applying the multiple regression method using the "enter" option, with calculated business performance as the dependent variable and Customer Factor, Organization

Factor. Industry/Sectoral Factor and Environmental Factor as the independent / predictor variables. the following significant model emerged:

$$\mathbf{F_{4,41} = 21.952,\ p < 0.0005.\ Adjusted\ R\ square = 0.651.}$$

In other words. the represented model accounts for 65.10 percent of variance (adjusted R square value) and the overall significance of the model is less than 0.0005 (p value).

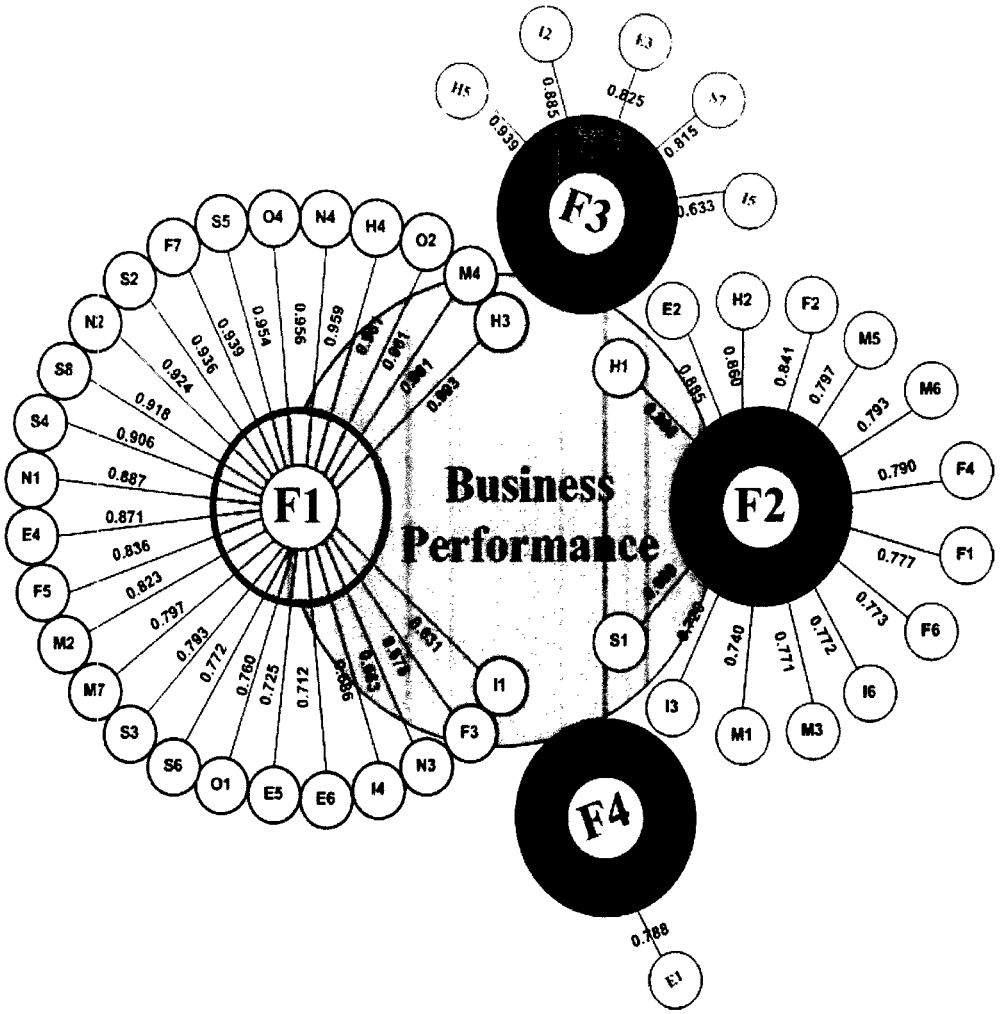
Significant predictor variables of the model are also arrived at during this stage of analysis. According to Brace et al., (2006) the beta value (standardized regression coefficients) is a measure of how strongly each independent/predictor variable influences the dependent variable. Based on this, we can conclude that the independent variable Customer factor with a beta value of 2.486 and a p of < 0.0005 has the greatest impact on business performance. This is followed by the Organization factor (beta = 1.729: p < 0.0005) and the Industry/Sectoral Factor (beta = 1.164; p < 0.0005). It also emerges that the Environmental factor (beta = 0.548; p < 0.0005) has the least influence on business performance when compared to the other three

According to Gaur and Gaur (2006). the regression coefficients and their significance obtained by applying multiple regression procedure on the available data. can be used to construct an ordinary least squares(OLS) equation. This equation is constructed by using the "Constant" corresponding to the un-standardized "B" value and standardized coefficients "Beta" values for four factors (F1. F2. F3. F4). The equation is represented below :

Business Performance(RTS) = -81.725 + 129.788 (F1) + 105.812 (F2) + 99.756 (F3) + 105.134 (F4). *(where F1= Customer Factor; F2= Organization Factor; F3= Industry/Sectoral Factor; F4= Environmental Factor).*

The model above (ordinary least squares(OLS) equation) represents the "quantitative influence" of the four individual factors in the four factor solution to predict business performance of organizations in the Life Sciences BPO industry domain. In other words. it also represents the generic / reference business model framework which reflects the relationships of elements (critical success factors) and their effect on industry performance of businesses in the Life Sciences BPO Industry Domain (illustrated below).

Generic Business Model Framework for Life Sciences BPO Industry



F1=Customer Factor; F2=Organization Factor; F3=Industry/Sectoral Factor; F4=Environmental Factor.

H3=Skills & Attitude; M4=Customer Relationships & Management; O2=Quality Systems;H4=Domain Knowledge; N4=Technological Innovation; O4=Global Delivery Footprint (Operational Flexibility, Customer Focused Delivery); S5=Organizational Effectiveness; F7=Customer focused Practices; S2=Technology; N2=Operational Innovation; S8=Corporate ethics; S4=Management Commitment; N1=Service Innovation; E4=Technological; F5=Cash Flow Management; M2=Unique Positioning Advantage; M7=Customer Satisfaction Feedback; S3=Support Services / Systems; S6=Business flexibility (Strategic); O1=Process Management; E5=Global business cycle; E6=Regulatory; I4=Bargaining Power of Buyers; N3=Marketing Innovation; F3=Cost Structure; I1=Threat of Substitute Products / Services; H1=Availability; E2=Economic (Internal to the organization); H2=Employability; F2=Access to Capital markets; M5=Sales Force Size & Productivity; M6=Sales Force Geographic presence; F4=Revenue Stream; F1=Investment; F6=Sustenance; I6=Bargaining Power of Complementors; M3=Business Flexibility (Marketing); M1=Depth of Services; I3=Competitive Rivalry Within Industry; S1=Physical Infrastructure; H5=HR practices; I2=Threat of New Entrants; E3=Socio cultural; S7=Partners / Collaborators / Enablers; I5=Bargaining Power of Suppliers; E1=Political.

At the center of the above illustration lies business performance, illustrated as a huge circle. Big circles surrounding this with the descriptions of F1, F2, F3, F4 (corresponding to Customer Factor, Organization Factor, Industry/Sectoral Factor, Environmental Factor respectively) represent individual themes arrived at from the EFA(four factor solution) stage of the study. Smaller circles connected through lines

to these "big theme circles", with descriptions like H1, O4, F2 etc., represent elemental CSF's corresponding to elemental CSF's categorized / thematized under one of the four themes obtained from the four factor solution.

The numbers (values) on the lines connecting elemental CSF's to their parent themes represent the strength of influence of that particular elemental CSF on that specific theme. Hence these numbers indicate the magnitude of influence a particular elemental CSF has on the theme and hence business performance and success. For example, the magnitude of influence of elemental CSF H3 is 0.993 on theme F1 compared to that of N3 which has a magnitude of 0.683. This shows that the quantitative influence of elemental CSF H3 is 0.993 on F1 when compared to that of elemental CSF N3 which has a quantitative influence of only 0.683 on the theme or factor F1.

Stronger the theme's effect on business performance and success, larger is its overlap with the business performance circle in the illustration above. For example, since theme F1 has the most influence on the outcome (business performance, success) the amount of overlap of the F1 circle with the Business performance circle is larger compared to that of theme F4.

Hypothesis Testing

Although existing literature refers to the effect of business model on business and industry performance Malone et al. (2006), Zott and Amit (2002), there was very limited literature on identified critical success factors, their relationships and effects on business performance in Life Sciences BPO Industry. Moreover, there were no published literature on identifying critical success factors affecting business performance and their relationships specifically with reference to the Indian Life Sciences BPO Industry. The reviewed literature on business models for the Life sciences BPO industry provides only a limited scope to identify significant themes and derive satisfactorily theoretical items / categories / components (critical success factors) affecting business performance.

Due to this limitation, the study was designed and research carried out to identify elemental critical success factors, their category themes, relationships between these elemental critical success factors and their effect on business performance of Life

Sciences BPO Industry. After identifying the critical success factors, their relationships and the nature of their effect on business performance, the hypothesis that "(H_0) : An organizations' business performance is independent of its business model" was tested.

To test the above hypothesis, the strength of the relationship between two variables, RTS values obtained from factual financial data and scores obtained for organizational business models were tested. The scores for organizational business models were considered from responses of 46 individual respondents of organizations out of a total of 28 BPO and 18 CRO service provider organizations selected from 117 respondents.

Pearson's test for bivariate correlation was utilized to test for correlation between the above indicated variables. When one interprets results of the Pearson's correlation test it becomes evident that there is correlation between Business Performance (RTS value) and Business Models (Respondent Scores). We can observe that the correlation coefficient between Business Performance and Business Models is 0.689 and the p value for two-tailed test of significance is less than 0.0005. From this we conclude that there is a positive correlation between Business Performance and Business models at the significance level of 0.01. Due to this, we reject the null hypothesis H_0 which in turn means that Life Sciences BPO organizations business performance is dependent on its business model.

Since this research study is exploratory to a limited extent in nature, it was not possible to develop a more comprehensive set of a priori hypotheses. However, an initial working hypothesis as described above was arrived at and post conduct of the exploratory factor analysis, the factors observed as a result of the factor solution were used to construct further working hypothesis as described below. On identifying elemental CSF's, analyzing the themes and exposing this data set to exploratory factorial analysis we arrived at a four factor solution. Furthermore, to have a better insight into critical success factors, and the influence of these four component factors on business performance, 4 working hypothesis which evaluated the dependence of these individual four factors on business performance were tested.

According to Gaur and Gaur (2006), if the null hypothesis states that there is no relationship (independent) between variables under study, (in this case business

performance and "Customer Factor") the beta coefficient ((standardized regression coefficients)obtained using multiple regression analysis and ANOVA) should not be different from zero.

The beta coefficient value(2.486) for the Customer Factor (F1) is at a significance of <0.0005 (p value). Since the beta value is not equal to zero, we reject the null hypothesis and accept the alternate hypothesis. So, we conclude that the business performance of an organization is related to or dependent on its "Customer Factors". Similarly, the beta coefficient and p values for Organization Factor (F2) are 1.729 and < 0.0005 respectively, due to which we reject the null hypothesis and conclude that performance of an organization is related to or dependent on its "Organization Factors". The beta coefficient and p values for Industry/Sectoral Factor (F3) are 1.164 and < 0.0005 respectively. Due to this we reject the null hypothesis H_{03} and conclude that performance of an organization is related to or dependent on its "Industry/Sectoral Factors". For Environmental Factor (F4) the beta coefficient value is 0.548 and $p < 0.0005$. Based on this we reject the null hypothesis H_{04} and conclude that performance of an organization is related to or dependent on its "Environmental Factors".

The above provides us with sufficient evidence that to conclusively conclude that business performance of any organization in the Life Sciences BPO Industry domain depends positively on Customer Factor, Organization Factor, Industry/Sectoral Factor and Environmental Factors. Since these are constituent of business models unique to this industry segment we conclude that business performance of Life Sciences BPO organizations depend on their business models.

Comparative Analysis

On completion of hypothesis testing, the next conclusive step in this study was to compare the values obtained by applying the generic business model to values of business performance obtained using factual data to individual organizations.

Rank based hierarchical lists were constructed using data collected through :

- Completed, useful comparative analysis questionnaire received from 33 respondents ("Hierarchy list of organizations based on the Generic Business Model") and

- By obtaining market performance metric Returns to shareholders (RTS) based on factual financial data ("Hierarchy list of organizations based on RTS Market Performance Measure").

The first part of this comparative analysis was carried out on data received through 33 useful survey responses. Survey responses of each respondent from the specific organization were used to "run" the constructed generic business model framework described above. The output of this process was the " predicted business performance metric (RTS)". This corresponds to the anticipated business performance or success value for that particular organization based on available/existing essential, elemental CSF's in that particular organization. These existing elemental CSF correspond to those identified by the four factor solution as essential for business performance of India based Life Sciences BPO organizations.

A second questionnaire was created by utilizing elemental critical success factors identified by the four factor solution arrived at through Exploratory Factor Analysis. These identified factors were placed in the same sequence as dictated by the four factor solution based on the individual factor loading value of the individual elemental critical success factors. Essential verbal modification of these elemental critical success factors to ensure a better understanding of each of these elemental factors were only applied for creating this questionnaire for comparative analysis. The verbal modification was strictly enforced to introduce a more sentence based critical success factors description since the questionnaire was exposed to respondents as is, without further categorization under specific themes.

This questionnaire was sent to pre-selected organizations and respondents working in those specific organizations which were selected based on specific criteria. The organization selection criteria were defined to ensure that the researcher would have direct access to unbiased, statutory information to help evaluate business performance based on selected financial parameters. The respondents' criteria were defined to ensure that they have the best knowledge about the Life Science outsourcing industry and have direct experience with the outsourcing function and hence were capable of providing useful inputs.

Using the above described screening process, a total of 45 invitations were sent out to a much focused sample frame and at the end of the survey window, 36 responses were

submitted/received. The response rate was 73.35% as only 33 of the received responses were considered usable since 3 incomplete responses were lost for follow-up. The response rate for this survey is high due to the fact that the sample size was small and there was a vigorous follow-up through personal calls to ensure the survey was completed and returned.

On completion of the survey window, data collected was cleaned as mentioned previously and made ready for further analysis. The questionnaire was designed such that the respondents had to answer either YES or NO to each of the questions based on the availability of that particular factor, parameter, competency etc.. in their organizations. Each YES was scored 1 and NO a zero. These values indicate existence or non-existence of specific essential CSF's which influence business performance and success of Indian Life Sciences BPO Industry.

The sum of the above responses corresponding to each of the four factors were then calculated and used for further analysis. The quantitative generic business model framework was applied to the calculated response values as described to each of the 33 responses. The difference in these derived values indicate essential CSF's existing in an organization and hence the uniqueness of that specific organization's business model in this specific industry segment.

Out of 33 derived values depicting 33 different organizations specific business models. only 21 business models were identified as unique (non-duplicate derived business model values). Data presented also helps us better understand the differences or uniqueness of the business models of specific organizations. For example, BMOD1 is Business Model type 1 and consists 11 essential CSF's out of 26 essential CSF's of the Customer factor(F1) theme. 8 essential CSF's out of 14 essential CSF's of the Organization factor (F2) theme, 0 essential CSF's out of 5 essential CSF's of the Industry/Sectoral factor (F3) theme and 0 essential CSF's out of 1 essential CSF of the Environment factor (F4) theme. These characteristics of the business model are exhibited by Indian BPO organizations BP5; B13 and B17. Based on these characteristics. the generic business model framework value obtained for this specific business model was 2192.439.

In other words. business models having the above characteristics would have a predicted business performance and success value (RTS) of 2192.439. So. a higher

generic business model framework value indicates that the specific business model would help the organization perform better compared to other organizations with different business models.

The above identified 21 unique business models were then compared and ranked based on the predicted business performance value to obtain a hierarchy list of organizations called – "Hierarchy list of organizations based on the Generic Business Model".

From the above list it becomes clear that, on comparison of 21 unique business models of 33 different organizations, organization "BP7" (BPO Service Organization 7) with a business model of the type "BMOD21" would provide or exhibit highest business performance(Ranked 1) measured as RTS when compared to other organizations with different business models in this sample set.

Business model "BMOD21" exhibits the following characteristics:

- Consists of 44 elemental CSF's when compared to that of the required 46 elemental CSF's based on the generic business model framework
- Consists 25 out of 26 essential CSF's of the Customer factor(F1) theme.
- Consists 13 out of 14 essential CSF's of the Organization factor(F2) theme.
- Consists 5 out of 5 essential CSF's of the Industry/Sectoral factor(F3) theme
- Consists 1 out of 1 essential CSF of the Environment factor(F4) theme
- Predicted RTS value is 5142.445 out of the maximum expected (predicted) RTS value of 5378.045.

Organizations "BP9" and "BP18" both have the RTS predicted value of 5042.69 and hence have a mean ranking of 2.5, which means both these organizations have similar business models which predict similar business performance (RTS) values.

In this study, out of the 33 organizational business models compared only 21 unique business models were identified with 4 organization in the CRO (Clinical Research Organizations) group and 8 organizations in the BPO (Business Process Outsourcing Organizations) group exhibiting similar business models with similar predicted RTS values. In other words all these similar organizations should have almost similar business performance (RTS) and business success outcomes.

This is not surprising since identifying a USP for various organizations in this industry sector is quite difficult as organizations primarily differ more on quantitative terms rather than qualitative terms. For example, in terms of global operational footprint – one organization may have a presence in say 6 different geographies with 1000 employees whereas another firm may have an operational presence in say 3 geographies but with the same number of employees.

For the second part of this comparative analysis as all the organizations selected were publicly traded appropriate sources (annual reports and stock trading exchanges – when required) were used to collect factual data to carry out the process of generating the "Hierarchy list of organizations based on RTS Market Performance Measure".

Based on this, financial data obtained from legitimate sources for each of these 21 organizations with unique business models were analyzed by applying the RTS measure and ranked based on the results obtained. The first organizations in the list of 33 organizations with similar, predicted RTS values were considered for analysis at this point. As the study focuses on comparing unique business models the above indicated procedure was utilized to generate the list named – "Hierarchy list of organizations based on RTS Market Performance Measure".

Understanding the association between predicted RTS value and factual RTS value would be helpful. Hence as the next step we compare rankings based on predicted RTS value (arrived at by applying the generic business model framework to respondent data) and rankings based on factual RTS value (obtained through secondary research).

Since we had to compare two rank variables to measure the strength of association or lack of it, the Spearman's Rank Correlation statistical test was applied to both the hierarchy lists ("Hierarchy list of organizations based on the Generic Business Model"; "Hierarchy list of organizations based on RTS Market Performance Measure"). This was done to determine the association between the generic business model framework predicted RTS value conceptualized through this study and the factual market performance metric (RTS) to understand association between both these parameters if any through a hypothesis.

A Spearman's Rank Order correlation was run to determine the relationship between 21 organizations' generic business model framework predicted RTS value and factual

RTS derived data. It was observed that there is a strong, positive correlation between generic business model framework predicted RTS values and factual RTS derived data, which was statistically significant ($r_s(19) = 0.526$, $p = 0.014$).

Since there is a strong statistically significant association between the two rank scores we reject the null hypothesis (H_{05}) in this case and accept the alternate hypothesis. From the above it is clear that the predicted business performance and success metric values (RTS) have a positive correlation with factual business performance measure (RTS). Hence ranking of 33 organizations exhibiting 21 unique business models based on predicted RTS values obtained by applying the constructed business model framework clearly indicates comparison and ranking of organizations based on business performance.

In other words this test proves that there is an association between the generic model generated RTS values and factual RTS values for Indian Life Sciences BPO organizations. Hence this constructed generic business model framework can also be used to theoretically evaluate the success of a business model in the Indian Life Sciences BPO domain.

CONCLUSIONS AND LIMITATIONS

This chapter provides conclusions of the research study and managerial implications along with limitations of this study.

Overall, this research is aimed at improving the understanding of heterogeneity in business performance among organizations in the Indian Life Sciences BPO Industry. According to Slywotzky et al., (1997), Timmers, (1998), Tapscott et al., (2000) and Kaplan et al., (2004), this difference on why some firms do better than others is explained in the form of "business models".

Based on the work on various authors such as Magretta (2002), Petrovic et al., (2001), Timmers, (1998), Weill and Vitale (2001), Osterwalder and Pigneur, (2002), Ghaziani and Ventresca (2002), Rappa (2003) to name a few, the researcher defines a business model as "an essential conceptual structure that contains a set of elements (critical success factors) and their relationships that allows expressing an organization's unique strengths required to attain business success."

Hence, understanding the relationship between business models and business performance of organizations in the Indian Life Sciences Business Processing Outsourcing (BPO) Industry would help us better understand, explain and control the heterogeneity of business performance and success of various organizations in this specific industry segment.

From literature review, it is evident that there are no industry specific models, frameworks, tools which can be applied to create organization specific business models and compare these organizations based on their business performance. On comparison we can empirically understand the relationship between business models and business performance of organizations belonging to this specific industry.

Due to the lack of models or frameworks required to create business models, this study constructs a industry specific generic business model framework which is then used to identify existing business models, study, compare relationships and predict business performance of organizations.

Elemental Critical Success Factors

In conclusion, the research study finally lead to identification of 46 elemental critical success factors and eight themes under which these 46 elemental CSF were categorized.

1. The identified 46 elemental critical success factors include : Physical Infrastructure, Technology, Support Services, Management Commitment, Organizational Effectiveness, Business flexibility, Partners / Collaborators, Corporate ethics, Availability, Employability, Skills & Attitude, Domain Knowledge, HR practices, Process Management, Quality Systems, Global Delivery Footprint, Depth of Services, Unique Positioning, Business Flexibility, Customer Relationships, Sales Force Size, Sales Force (Geographic presence), Customer Satisfaction, Investment, Access to Capital markets, Cost Structure, Revenue Stream, Cash Flow Management, Sustenance, Customer focus, Political, Economic (Internal to org), Socio cultural, Technological, Global business cycle, Regulatory, Threat of Substitute Products / Services, Threat of New Entrants,

Competitive Rivalry Within Industry, Bargaining Power of Buyers, Bargaining Power of Suppliers, Bargaining Power of Complementors. Service Innovation. Operational Innovation. Marketing Innovation. Technological Innovation.

2. The eight identified themes were: Strategy (made up of 8 elemental CSF), Human Resources (5 elemental CSF). Operations (3 elemental CSF), Marketing(7 elemental CSF), Finance(7 elemental CSF). Environment(6 elemental CSF), Industry (6 elemental CSF) and Innovation (4 elemental CSF).
3. Four groups containing specific themes were identified to influence business performance in order of decreasing magnitude. These include Operation and Innovation (GROUP 1). Strategy, Human resources and Finance CSF themes (GROUP 2). Marketing and Environment theme CSF's (GROUP 3). Industry CSF (GROUP 4).
4. Constituent elemental CSF which has maximum influence on the theme Operations is Global delivery competency of the organization. for Innovations it is Technological innovation, for Strategy it is Management commitment. for Human resources - Skills & Attitudes of the resources, for Finance - Customer Focused practices. for Marketing - Customer Relationship & Management. for Environment – Regulatory and for Industry it is Bargaining power of buyers respectively.
5. The elemental CSF and the themes identified are extensive as they include factors under industry view, firm/organizational view. environment factors, technology factors. marketing factors, corporate factors. finance factors and innovation factors. This study has identified and includes elemental CSF's under all categories of construct themes of business models which affect business performance as identified by various authors.

To the researcher's knowledge. this is a new contribution to the literature on identifying elemental critical success factors essential in business models of Life Sciences BPO industry and attempts to provide an empirical platform to understand heterogeneity in business performance of various organizations with different business models in this specific industry. As there are no similar precedents in the literature. comparing or contrasting this with other research findings is not possible. However, there is strong support in the literature with reference to the methodology which has been used to arrive at these results.

Business Model Framework Construction

The generic business model framework specific to the Life Sciences BPO Industry was constructed based on the identified elemental CSF's and their relationships influencing business performance and success.

1. The study identified a Four Factor Solution which included Customer factor (comprising 26 elemental CSF's), Organization factor (14 elemental CSF's), Industry/Sectoral factor (05 elemental CSF's), Environmental factor (01 elemental CSF).
2. Customer factor has maximum influence on business performance and success of an organization represented by Returns to Shareholders (RTS) followed by Organization factor, Industry/Sectoral factor and Environmental factors respectively.
3. The generic business model framework accounts for 65.10 percent of variance (adjusted R square value) with an overall significance of less than 0.0005 (p value).
4. This generic business model framework constructed with 46 elemental CSF's, clearly and quantitatively depicts business models and their influence on business performance and success of organizations operating in the Life Sciences BPO Industry.
5. This framework or tool can be used to identify and classify business models existing in the Life Sciences BPO Industry. It can also be used to study and predict cause effect relationships between business models and business performance of organizations operating in the Life Sciences BPO Industry domain.

Again, to the researcher's knowledge, this is a new contribution to the literature on constructing a generic business model framework specifically for the Life Sciences BPO Industry. This attempts to provide an empirical tool to identify, classify and predict the effect of business model components on business or organization performance. This also confirms to research by Roquebert et al., (1996), Brush et al., (1997), McGahan et al., (1997), Chang et al., (2000), Bowman et al., (2001), Amit et al., (2001), Lubatkin et al., (2001), McNamara et al., (2003), and Vilmos et al., (2006) which proposes and confirms the view that elemental components of business models influence business performance.

Hypothesis Testing

Overall, five hypothesis were identified in the study and were tested to determine the independence or dependence of an organization's business performance on its business model. In conclusion this research study demonstrates that :

1. Heterogeneity in business performance of organizations in the Life Sciences BPO Industry domain is positively influenced by the organizations' business model. Higher the business model score for an organization, higher is its business performance, measured as Returns to Shareholders (RTS).
2. The business performance of an organization in this domain depends positively and directly on Customer Factor, Organization Factor, Industry/Sectoral Factor and Environmental Factors – the identified elemental components of organizational business models in the Life Sciences BPO Industry sector.

Results of Hypothesis testing

Sl.	Null Hypothesis	Accepted / Rejected	p value
1	An organizations' business performance is independent of its business model.	Rejected	<0.0005
2	An organizations' business performance is independent of "Customer Factor".	Rejected	<0.0005
3	An organizations' business performance is independent of "Organization Factor".	Rejected	<0.0005
4	An organizations' business performance is independent of "Industry/Sectoral Factor".	Rejected	<0.0005
5	An organizations' business performance is independent of "Environmental Factor".	Rejected	<0.0005

Although no specific studies in this industry sector were identified during literature review, these results conform to research by Amit and Zott (2001), Chesbrough & Rosenbloom (2002), Martinez & Kennerley, (2005), Mausollf & Spence, (2008), Melkers and Willoughby, (2005), Osterwalder et al., (2005), Melone et al., (2006), which confirm that relationships exist between business models and business performance of organizations in general.

Comparative Study

Completion of the comparative part of the study yielded the following

1. 33 business models based on the constructed generic business model framework were identified which were specific to the Indian Life Science BPO Industry.
2. Out of these 33 business models, 21 unique, Indian Life Science BPO Industry business models were identified.
3. Organizations having a higher number of elemental CSF's embedded in their business model perform better (on comparing and ranking organizations based on the identified business models and their predicted RTS values).
4. There is a direct and positive relation between the number of elemental CSF's present in a business model of an organization and its business performance in the Indian Life Sciences BPO Industry. Lesser the number of elemental CSF's in an organization, lesser is its predicted business performance value (RTS) and hence lesser is the organization capability to succeed in this industry segment.
5. There is a positive association between the predicted RTS values (based on the generic business model framework) and the factual RTS values (based on organizational financial data) of organizations exhibiting unique business models.

These finding confirm that a positive relationship exists between business model elements and business performance which is similar to finding of Amit and Zott (2001), Chesbrough and Rosenbloom (2002) and Osterwalder et al., (2005). The research of the indicated authors was in relation to other industries, sectors, segments and not specific to Life Sciences BPO Industry.

The results of this research study confirm that there is a strong, positive association between business models and business performance. This is empirically demonstrated through an association between business model predicted RTS values and factual RTS values of organizations operating in the Indian Life Sciences BPO Industry.

Study Limitations

The following limitations apply to this research:

1. This study confirms the existence of business model influence on business performance but does not help understand why this influence exists.

2. This study includes a maximum number non-financial and limited financial measures/factors in the generic business model framework.
3. The effects of different business model design frameworks have not been assessed in this research study.
4. This research did not attempt to investigate the effect of business models on all business performance measures. Additional business performance measures not studied in the current research could be investigated in future research.
5. There are a number of contextual factors that can influence a Business model and hence impact organizational performance (e.g., financial structure, leadership style etc.). This research did not seek to investigate all potential contextual factors. Additional factors not studied in the current research could be investigated in future research.

The above limitations provide an opportunity for further research to enhance knowledge in this area of management.

Contributions of this Research

The following contributions are envisaged from this research:

1. Better understanding of business model research, influence of business models on business performance and effect/influence of business models on business performance in Life Sciences BPO Industry.
2. Empirical identification of different and unique business models and designs.
3. Improvement in business logic representation, design and analysis of different business models.
4. Provide a roadmap for individual firms to exploit or modify their business models to improve their performance.
5. Provide an entrepreneurial tool to improve managing businesses in a rapidly moving, complex and uncertain business environment.

A COMPARATIVE STUDY OF BUSINESS MODELS OF INDIAN LIFE SCIENCES BUSINESS PROCESS OUTSOURCING INDUSTRY

THESIS

SUBMITTED FOR THE AWARD OF THE DEGREE OF

Ph. D. (Business Administration)

BY

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CERTIFICATE

This is to certify that the thesis entitled '**A COMPARATIVE STUDY OF BUSINESS MODELS OF INDIAN LIFE SCIENCES BUSINESS PROCESS OUTSOURCING INDUSTRY**', submitted to the Department of Business Administration, Faculty of management Studies & Research, Aligarh Muslim University in partial fulfillment of the requirements for the award of **Doctor of Philosophy** in Business Administration is a record of original work done by **Mr. C. Omprakash**, during the period of his study in the Department under my supervision and guidance. This thesis has not formed the basis for the award of any Degree, Diploma, and Associateship, Fellowship or other similar title to any candidate of any university.

5/3/2012

Dr. Mohd. Afaq Khan,
(Supervisor)

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Dr. K. S. Gupta

(Supervisor)

DECLARATION

I do hereby declare that the thesis titled **"A COMPARATIVE STUDY OF BUSINESS MODELS OF INDIAN LIFE SCIENCES BUSINESS PROCESS OUTSOURCING INDUSTRY"**, submitted to the Faculty of Management Studies and Research, Aligarh Muslim University, Aligarh for the degree of PhD (Business Administration) is a record of original work done by me under the supervision and guidance of Dr. Mohd. Afaq Khan, Assistant Professor, Department of Business Administration, Faculty of Management Study and Research, Aligarh Muslim University, Aligarh. (Internal Supervisor) and Dr. K. S. Gupta, Director, KSC Center for Learning and Development, Bangalore.

It has not, previously formed the basis for the award of any degree, diploma, associate ship, fellowship or other similar title to any candidate of any university.

Place: ALIGARH

Date: 05/03/2012

Signature of the Candidate

C. Omprakash

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To the essence of my life, my children, Charitha and Shrihari Aditya, thank you for bearing with my inconsistencies, missed promises, enforced silence and dictatorial discipline during this period. Hopefully, I will be able to make up to you.

To God, my parents and my parent-in-laws, I owe you everything.

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Chapter 1

Introduction

The term "globalization" was coined by Theodore Levitt, in 1983 through an article he wrote in Harvard Business Review entitled "Globalization of Markets", which appeared in HBR in its May-June issue (Mullman, 2006). The literature, however, has tended to date the start of globalization to a much later date, relating it to the experience of the West. However, there is no agreement on when globalization actually originated (Guillén, 2001).

Globalization has been defined by many authors in a variety of ways due to the varied approaches their definitions are based upon, such as economical, political, financial, technological etc., One common thread that comes out of the various definitions that exist for globalization is that globalization is primarily an economic phenomenon, involving the increasing interaction or integration of national economic systems all over the world through growth in international trade, investment and capital flows.

According to Raskin (2002), the phenomenon of globalization is also associated with a rapid increase in cross-border social, cultural and technological exchange whereas Jones (1995) aptly suggests that globalization may simply be an intensification of the process of international interdependence. It is a function of the growth of competition in an international free trade system which is intensified by the diffusion of technology.

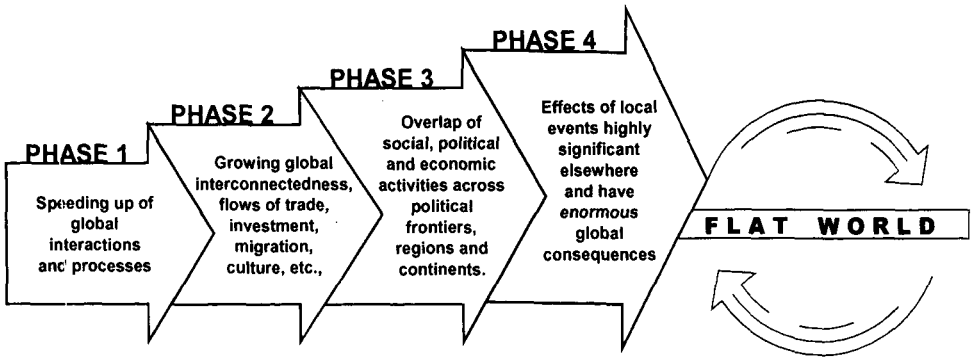
Globalization is characterized by the overlap of social, political and economic activities across continents and intensification of interconnectedness of trade and culture. This is leading to a situation wherein, distant, local events which can be highly significant elsewhere will have enormous global consequences. Due to this, the boundaries between domestic matters and global affairs are becoming increasingly blurred. A good example is the local US Subprime Crisis which is adversely affecting economies across the world.

According to Friedman (2006), globalization primarily brings about the following four types of changes:

- consolidation of social, political and economic activities across political frontiers, regions and continents.
- intensification, or the growing magnitude, of interconnectedness and flows of trade, investment, finance, migration, culture, etc.
- growing extensity and intensity of global interconnectedness can be linked to a speeding up of global interactions and processes, as the evolution of world-wide systems of transport and communication increases the velocity of the diffusion of ideas, goods, information, capital, and people.
- growing extensity, intensity and velocity of global interactions can be associated with their deepening impact such that the effects of distant events can be highly significant elsewhere and even the most local developments may come to have enormous global consequences. In this sense, the boundaries between domestic matters and global affairs can become increasingly blurred.

The following visual representation (Figure 1.1) depicts the various phases of change and their inter-relationships responsible for levelling the round world – leading to the phenomenon called "Globalization" – "Flatworldization".

Figure 1.1 - Leveling the round world flat



In a nutshell globalization can be thought of as the widening, intensifying, speeding up, and growing impact of world-wide interconnectedness.

In the last decades science and technology have experienced an impressive advance. According to Hodgson (2003) this is inherent to capitalism. Competition pressures firms to pursue profits through two main means. Firstly, the conquest of new markets by geographical expansion and/or the introduction of new products, such as new technologies or skills. Secondly, by cutting costs through the adoption of new technologies and new skills. Hodgson also explains that "in this quest for innovation,

the frontiers of science and technology are advanced, leading to new fields of knowledge and enquiry" Hodgson (2003). Furthermore, he argues that because "services are generally more diverse than manufactured goods; diversity also increases with the increasing relative size of the service sector".

In Osterwald's (2005) view, the link between information technology advancement and business models is particularly strong, since information technology advancement has been a strong enabler for a variety of innovative business models.

In summary, advances in information technology, specially internet technologies has contributed very significantly to enable worldwide real-time interconnectedness and these technology based innovations and advances have triggered the process of achieving competitive advantage by businesses across the globe, irrespective of the size, nature of business or the geographical location/s of these organizations.

By conceiving it in this way, it becomes possible to map empirically patterns of world-wide links and relations across all key domains of human activity, from military to the cultural. On mapping the world-wide patterns of this phenomenon it becomes evident that globalization has also brought about the following changes and advantages in some cases to businesses:

- global market for all products, leading to the creation of Global brands
- emergence of worldwide production markets and broader access to a range of goods for consumers and organizations
- global structures leading to greater and more efficient way of doing business
- development of a global telecommunications infrastructure and greater transborder data flow, using technologies such as the Internet, communication satellites, submarine fiber optic cable, and wireless telephones
- greater freedom of movement of goods, people, services and capital
- economical offshore production
- virtual real time communication
- standardization of logistics
- new technology niches etc.,

What can be distilled from the above is that the reality "Globalization forces everyone to compete with the cheapest producers" is brought into stark focus (Friedman, 2006).

To a business leader, this means that there are more challenges than ever from stakeholders such as competitors, customers, investors and regulators. The business also needs to survive, grow revenues, become more agile in the face of competitive and market pressures and provide customers with optimum service. One of the best ways to achieve this is through globalization of the organization. Achieving globalization at the organizational level would bring in widening, intensifying, speeding up, and growing impact of world-wide interconnectedness which can be used as a competitive advantage. Successful businesses are responding to this phenomenon of "global competitiveness" by optimizing their "business services" through outsourcing and hence attain a differentiation leading to a competitive advantage, from the business perspective.

Globalization for a business from the organizational context can be achieved through either outsourcing or through offshoring its business processes. Outsourcing can in turn be defined as an organizational practice to purchase goods from or to subcontract services to an outside supplier. On the other hand, Offshoring can be defined as a practice of moving business processes or services to overseas locations or vendors so as to reduce costs. Even though international trade economists have turned their attention to fragmentation/outsourcing only recently, the phenomenon, and terms to describe it, is not new. Landes (1998) traced the origin of outsourcing to 13th century Europe. It stemmed from attempts to reduce guild controls in the cities, and use abundant and cheap female and child labour force available in the countryside to produce finished yarn.

Outsourcing, primarily involves transferring ownership of an organization's business activities to a service provider. For a fee, the outside service provider carries out the activities and maintains responsibility for their outcomes (Chamberland, 2003). It has come into prominence only after the change management approaches of the past two decades have largely been exploited. Cost reduction and competitive positioning in the 1980s, process improvement and re-engineering in the early 1990s and enterprise resource planning, customer relationship management and web technologies of the late 1990s have all but run their course. To create value for a business in today's markets means transforming the organization into a focused, responsive, variable and

resilient business and can primarily be achieved through the Business Process Outsourcing (BPO) Model.

In a BPO relationship, some or all business processes which are normally not critical to the organization and do not form the "Core Competency" for the organization are outsourced to an external partner. The external partner in turn would own these processes, deliver services at agreed upon levels and add value by improving the process. At the end of the contract the external vendor would – if previously agreed upon transfer the improved process back to the customer.

In this study, the focus is only on outsourcing of business processes leading to optimization in the Life Sciences industry. The term Life Sciences includes the biomedical, biotechnology, medical devices and the medical diagnostic industries. The generic model framework being evolved in this study creates and implements an effective model that predicts the essential, elemental critical success factors and their relationships which affect business performance of organizations in the Life Sciences BPO Industry.

1.1. Life Sciences Industry characteristics and trends

In this research study when we refer to Life Sciences industry we focus our attention primarily to the biomedical industry which is in the business of discovering and developing medical solutions, products, procedures etc., to treat unmet medical needs. Although the study encompasses both, business process outsourcing customers and service providers to this industry segment, the outcome of this study can be applied to any industry with similar characteristics.

The biomedical industry develops innovative products for the prevention, treatment, and cure of human diseases. The industry is composed of four primary segments:

- Pharmaceutical segment: which is the industry's mainstay and is composed of large, fully integrated, global players.
- Biotechnology segment: which is a comparative upstart, having emerged commercially only 30 years ago, but it is increasingly the engine of innovation in biomedicine.

- Medical device segment: which is much older than biotech, but is composed of fewer players, and owing to the nature of its products, exemplifies the life-saving power of "convergence": a marriage of engineering know-how and biomedical science.
- Diagnostics segment: which has grown up along mainstream pharmaceuticals, and has acquired a new dynamism and centrality since the advent of the genomics revolution.

These segments were long regarded separate and distinct, but in the 21st Century these should be considered as fundamentally convergent and increasingly interrelated so to ensure there is a more integrated approach to treat a disease or an unmet medical need. A spate of recent mergers, acquisitions, partnerships happening around the globe between diagnostics, medical device, biotechnology and pharmaceutical organizations in this sphere, indicates that the convergence model has been initiated and is under progress.

This industry invents products that people need to avoid illness, maintain their health and save lives. The importance of its products for individual and public health sets up high expectations for performance and commitment. Hence it is essential that the industry fulfils its commitment by providing safe and effective medicine on time.

Although a recent study shows that most consumers believe prescription drugs have a positive impact on people's lives (DiMasi, 2001) the positive impact occurs only when new medicines satisfy rigorous safety standards, provide new hopes and good outcomes, offer good value and are widely accessible to patients.

According to Löffler (2006) the biomedical industry is made up of large, fully integrated, global players who have built competencies – right from discovering a drug to marketing the product globally. It experiences explosive growth in markets for the treatment of both chronic and acute illnesses where these markets are driven by a confluence of political and demographic trends – most notably globalization and population growth and aging -- as well as by new products resulting from the genomic discoveries of the late 1990s and early 2000s and a generally favourable policy environment.

The biomedical industry is characterized by some fundamentally unique forces due to the nature and end use of products it manufactures. Certain characters which are unique to this industry as listed under Figure 1.2 given below.

Figure 1.2 - Biomedical Industry Characteristics

• Driven by science.	• Requires specialized human capital.	• Very high science risk.
• Formidable regulatory oversight.	• Exposed to a wide range of ethical and political issues.	• Constant innovation and discoveries very essential.
• Needs to constantly generate and adapt new technologies especially in drug discovery.	• Market demand is disease driven and cannot be influenced.	• The commercialization process is distinctive across the industry.
• Intellectual property right protection defines revenue life cycle of products and hence key for growth.		

The global biomedical market was reported to be about US $643 billion in 2006 (IMS, 2007). The US, Europe and Japan account for 77% of the market although they account for less than 15% of the global population (Scheffler and Pathania, 2005). Among the developed countries, the US dominates, it accounts for 38% of all global spending. The US market is huge and very important not just because it is the most populous of developed countries but due to a relative absence of price controls. The unit realizations of biomedical companies are higher in the US.

For biomedical organizations, the challenge lies in shaping their business strategy and their competitive landscape in terms of profits, costs, and above all ethics. With significant technological advances in the drug discovery process and the development of the biotechnology industry, biomedical organizations are facing increased pressure to produce more and better drugs, at a faster rate and with greater economic benefits to the business. Hence, unlike most other sectors the biomedical industry focuses on and allocates the majority of its resources to the process of drug discovery and development, whilst processes such as manufacturing, marketing, and logistics are very much secondary (Halliday et al., 1997).

The R&D process is a long and uncertain road from the laboratory to the marketplace. Only 1 in 5000 promising molecules makes it to the product stage. On average, cost of developing each new medicine costs US$800 million in R&D costs (US Department of Health; 2006) and takes almost 10-15 years on average to get through all the stages of development (US Department of Health, 2005). Estimated total biomedical R&D expenditures in 2005 was around $51.3 billion (Pharmaceutical Research and Manufacturers of America (PhRMA), 2006).

A study by CMR International and Accenture clearly articulates that to consistently deliver one submission of a new medicine to the US FDA (the regulatory agency which reviews information submitted by biomedical companies and then authorises marketing of the medicine in the US), a biomedical company focusing exclusively on new targets, should initiate 90 new projects, considering a 10 percent success rate and an existing total discovery portfolio of approximately 200 projects.

Coupled with this inherent pressure on the industry's business model, the factors indicated below, have created a challenging environment to the industry, which, after decades of exceptional growth is going through a period of slow earnings expansion. These diminished returns show-up clearly in the stock market where biomedical companies' valuations are at a high time low.

- Declining worldwide margins for biomedical industry when EBIT% is considered is very visible. (EBIT: Earnings before interest, taxes, weighted average of top 10 companies by margin for which data was available) (Bloomberg).
- Faltering sales and marketing campaigns associated with high costs of administrative overheads (market valuation implies only a 4% growth in sales rate) (Economist, 2005).
- A continuing trend is declining drug development productivity (higher costs, fewer medicines) affecting portfolio management and lifecycle management reflected by the trend of having no new launches from 33% of the 16 top Pharma companies in 2003. Both in Europe and in the US only 12 products were launched by the top 16 companies in 2003. This compares with 16 and 15 in Europe and the US respectively in 2002.
- Declining global biomedical sales on a year on year basis, compared to 14.50% in 1999 to around 7.0% in 2006. (Source: IMS Health Market

Prognosis (includes IMS Audited and Unaudited Markets); All information current as of March 2, 2007).

- The number of drug development projects initiated has been stable since the 1990s despite an increase in spending; success rates in each phase of development have declined; and the phases of development have taken longer to complete. There are many reasons for this, including increased regulatory scrutiny, the current focus on chronic diseases, the inflation of development costs, increased focus on product safety and more aggressive patent challenges, which can make it difficult to focus on new indications.
- Slender medicines pipeline affected by loss of patent or imminent loss of patent protection (Only 4 NME's in Europe and 7 in US introduced in 2005 – IMS Report, 2005).
- Loss of public trust due to safety issues leading to withdrawal of marketed products (E.g.: Merck's Vioxx) (Economist, 2005)
- The primary theme for the Big Pharma peer set is the continued onslaught of generics, eroding the sales of small molecule CNS and cardiovascular blockbusters (Datamonitor, 2006), leading to increased competition from generic (me-too) and biological medicines. For e.g.: the U.S. prescription generic drug market is projected to grow from an estimated $11.1 billion in 2001 to more than $19 billion in 2006, representing an average annual growth rate (AAGR) of 11.4%.
- Pricing pressures due to rigid pricing and reimbursement systems in Europe, parallel trade, re-importation, re-categorization – OTC, generic substitution, reference pricing etc., Cambridge (2003) estimates US re-importation of prescription biomedicals from Canada was equivalent to US$1.1 billion or approximately 0.5% of total US sales. Growth was up 134% in 2003 compared to 2002.
- Pricing pressure in the US, to get products approved and reimbursed by third party payers.
- Long development times, a lack of coordination within the company, not enough insight into customers, and a risk-averse corporate culture associated with limited application of the principles of strategic management to drug discovery

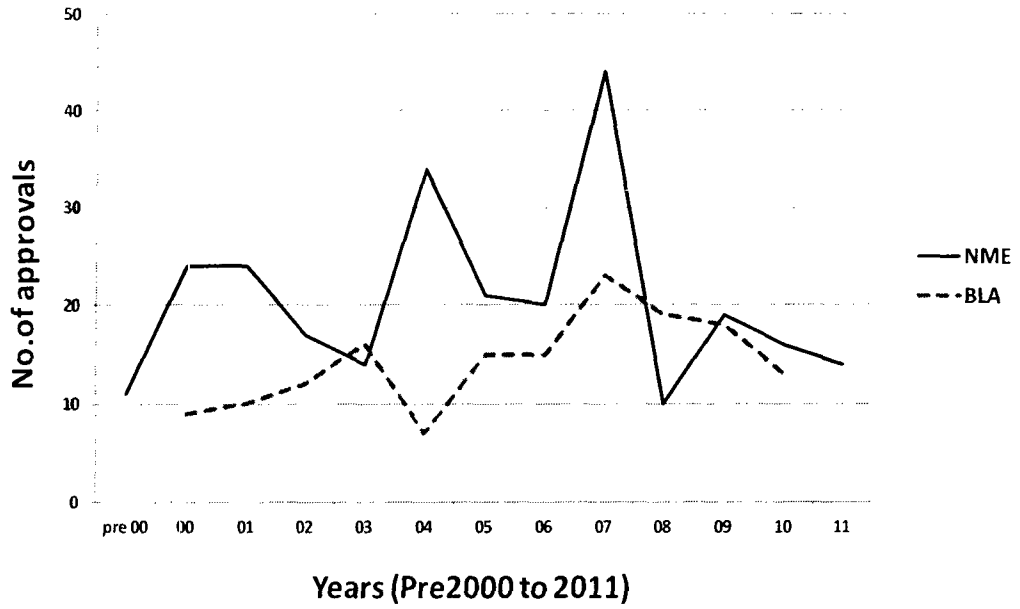
- The biomedical industry not seeking innovative ways to reduce their overall cost structure, while delivering a broader range of products and services to customers with increasingly shorter lifecycles – as being demanded by the market.
- Globalization, organizational issues (such as metrics and measurement, structure, and people), and leadership remain three of the biggest challenges facing companies that are seeking to become more innovative.
- Socio-political sensitivity around equal market access for all citizens, particularly to critical life-saving medicines, could become a major public affairs issue for the industry.
- Faced with failing growth, the Pharma industry is pursuing options like M&A with other Pharma companies, biotech, Mid Pharma and/or generics manufacturers and acquisitional moves outside of 'Pharma space' to increase presence in medical devices, diagnostics and consumer healthcare. (Datamonitor, 2006). This movement would typically bring-in its own set of problem and ultimately not help put its house in order.

Barbhaiya (2005) indicates ever increasing timelines for drug development and a flat R & D productivity judging by the numbers of Investigational New Drug Applications (for approval to test a new drug in man for the first time – to demonstrate the product is safe and effective when used) and New Drug Applications (for approval to commercially market the new medicinal product) filed in the last 15 years – even with an exponential increase in R & D budgets. He also states that Pharma R & D failure is a norm since it's associated with a cumulative program success rate of just 1.5%.

In summary, he states that existing data indicates a fivefold increase in R & D spending with a modest increase in Investigational New Drug submissions and essentially a flattening of new drugs (new chemical entities) approvals for commercial use.

The researcher's own study using data provided under Thomson Reuters "IDRAC" (a source of trusted global regulatory intelligence) database also confirms the approval rate statements given above. The approval trend of New Molecular Entities (NME) versus Biological Entities (BLA – biologic license approvals) is presented in Figure 1.3 given below. On an average, the linear graph would remain flat.

Figure 1.3 - NME vs. BLA USFDA Approvals (2000-2011)



From the above factors it becomes evident that over the past decade, biomedical and life sciences companies have entered a difficult period where shareholders, the market and regulators have all created significant pressures for change within the industry. From thinning product pipelines and skyrocketing operating costs to calls for lower prices and a greater regulatory burden, the industry is confronting unprecedented challenges that are expected to radically transform the business.

In an atmosphere of declining research and development (R&D) productivity, mounting pricing pressure and changing regulatory requirements, global biomedical and life sciences companies face increasing challenges to achieve and maintain profitable growth, (PwC, 2006). Global biomedical business process outsourcing offers life sciences organizations an opportunity to overcome these challenges. By forming strategic relationships with outsourcing partners, companies can optimise their business services supply chain by inculcating delivery system innovation, focus on core competencies, progressing up the value chain, access specialized expertise, achieve cost-saving benefits and reduce burn rates that lead directly to greater shareholder value (by creating differentiation and hence competitiveness).

1.2. Motivation for this Research

Although global biomedical business process outsourcing seems to offer life sciences organizations an opportunity to overcome its inherent problems or challenges,

understanding the elements and organization structures which control and hence influence the final outcome of this process become very critical. In other words, understanding the elements of the business process outsourcing (BPO) business model, their influences and their relationships can help us predict the effect of the business models on the organization's business performance.

Even though the concept of business model is potentially relevant to all firms, a search of the organization, economic, and strategy literatures, resulted in finding a few articles on the subject, and just one largescale empirical study (Amit and Zott, 2001). Although several authors have provided useful frameworks for analyzing businesses, such as profit models (Slywotzky, et al. 1997) and strategy maps (Kaplan and Norton, 2004) these approaches are based on a tradition of classifying firms into "internally consistent sets of firms" referred to as strategic groups or configurations (Cool and Schendel, 1987). These groups—typically conceived and organized through the use of typologies and taxonomies (Miles and Snow, 1978) were often used to explore the determinants of performance. None of these authors provided any insight on the biomedical outsourcing elements, typologies, taxonomies and their effects on business performance/success.

It thus becomes evident that few concepts in business today are as widely discussed—and as seldom systematically studied— as business models. Many people attribute the success of firms like eBay, Dell, and Amazon, for example, to the ways they used new technologies—not just to make their operations more efficient—but to create new business models altogether (Gurley, 2001). In spite of all the discussion about business models, however, there have been very few large-scale systematic empirical studies of them. This is especially so in the area of understanding the effect of business models on business performance/success in the Indian Life Sciences BPO industry. We do not know, for instance, how common different kinds of business models are in the economy and whether some business models have better financial performance than others.

This brief summary of related literature has motivated this research and this study provides a first attempt to answer these basic questions about business models and their effect on business performance/success in the Indian Life Sciences BPO industry. The research provides a theory-grounded proposal for understanding the effect of business models on business performance/success primarily through an

empirical approach. Specifically, the researcher is interested in the primary question of whether business models have performance implications.

1.3. Dissertation Organization

Chapter 2 examines prior literature with respect to elements, constructs, relationships of business models and its effect on business performance. In addition, it also includes description on topics which were used in carrying out specific pilot studies related to this research. This chapter includes the selection of a single business performance metric used in this study.

Chapter 3 describes research methodology used in this study. It also includes the study approach of this research. It also explains development of the survey instrument including content validity assessment and reliability analysis of the survey instrument.

Chapter 4 explains different tests applied to the survey data, presentation of results and interpretation of the test results. It also presents the results of hypothesis testing and comparative analysis. It also provides discussion of the result findings of the study.

Chapter 5 presents conclusion of this research including construction of the generic business model framework, the limitations of the study and contributions of this research, the limitations of the study and application of the findings to entrepreneurship and strategic management research, practical implication for managers and Future research.

Chapter 2

Literature Review

This chapter presents a review of literature related to the current research. In order to provide background information and justification for the research framework, the first section begins with an overview and discussion of business models. In this section, definition, configuration, approaches towards constructing a generic business model framework are presented followed by a discussion of contextual factors influencing the development and use of business models.

The second part discussed critical success factors, their essentiality and methods on how critical success factors are identified. Next we discuss business performance measurement systems from the performance measurement literature and then the chapter moves towards selection of a business performance measure.

A discussion of resource based theory is also provided to support the relationship between organizational learning and organization performance. Subsequently, the chapter continues with a discussion and recommendations related to study of organizational performance. The chapter ends with a brief summary of the research model.

2.1. Business Models

2.1.1. Background

The first systematic and comparative account of growth and change in the modern industrial corporation was presented by Alfred Chandler in his seminal Strategy and Structure (Chandler, 1962). He showed challenges of diversity implicit in a strategy of growth called for imaginative responses in administration of the enterprise. In his subsequent work, Chandler (1990) also showed how scale and scope economies provided new growth opportunities for the enterprise during the second industrial revolution. Chandler (1990) research question in part is as follows, 'It then becomes critical to explain how and why the institution [of the modern industrial firm] grew by adding new units—units that carried out different economic functions, operated in different geographical regions, and handled different lines of products.' Later in the

volume, he includes the introduction of new products, based on internal research and technology, as part of this definition.

The ideas from Strategy and Structure was built upon and applied to emerging concepts of corporate strategy by Ansoff (1965). Strategy came to be seen as a conscious plan to align the firm with opportunities and threats posed by its environment. Andrews (1987) was one of the first theorists to differentiate between a business strategy and a corporate strategy. He held the former to be 'the product-market choices made by division or product line management in a diversified company' and that corporate strategy was a superset of business strategy. Like business strategy, corporate strategy defines products and markets— and determines the company's course into the almost indefinite future. He also indicates that a company will have only one corporate strategy but may incorporate several business strategies into it. Thus, a firm's current businesses influenced its choice of likely future businesses as well.

While the notion of strategy was subsequently developed in different directions, one branch of its development was to research into how managers could leverage the resources of the organization beyond that organization's current business. Early work started from a cognitive model of rational calculation and full information. Teece (1982) built a framework where a firm's underutilized resources, combined with imperfections in the markets, conferred advantage for diversification moves to the organization. Empirical evidence has shown how a firm's technological position helped it enter nearby business areas, because experience in 'related' technologies reduced the costs of entering into adjacent areas (Teece et al., 1993; Silverman, 1999). Mintzberg (1994) identified the 'emergent' character of many successful strategies, and emphasized the importance of adaptation over planning while Burgelman (1983) developed a process model for how a firm can enact strategic change based on managing limited information.

A later branch of the strategy literature incorporated cognitive bias into the idea of strategy. Prahalad and Bettis (1986) introduced the notion of a dominant logic: a set of heuristic rules, norms and beliefs that managers create to guide their actions. This logic usefully focuses managers' attention, as they seek new opportunities for the firm. Empirical examples of this path-dependent behaviour can be found in

semiconductor equipment (Henderson and Clark, 1990), disk drives (Christensen, 1997) and typesetting (Tripsas, 1997). Some scholars conclude that firms may indeed develop the ability to manage new technological opportunities effectively if they invest in integrative capabilities (Henderson, 1994), ambidextrous internal processes (Tushman and O'Reilly, 1997) or complementary assets (Tripsas, 1997). Other scholars believe that the firm must avoid internal resource allocation processes, and manage disruptive technologies outside the main business (e.g. Christensen, 1997).

Chesbrough & Rosenbloom (2002), contribute to this literature by offering the business model as a construct that can inform these earlier perspectives. He indicates that the business model provides a coherent framework that takes various organizational characteristics and potentials as inputs, and converts them through customers and markets into economic outputs. So, the business model is thus conceived as a focusing device that mediates between technology development and economic value creation. They also indicate that the failure of firms to manage effectively in the face of technological change can be understood as the difficulty these firms have in perceiving and then enacting new business models, when technological change requires it. They also argue that firms need to understand the cognitive role of the business model, in order to commercialize technology in ways that will allow firms to capture value from their technology investments, when opportunities presented by its technologies do not fit well with the firm's current business model.

Chesbrough & Rosenbloom (2002) contrast the concept of business model to that of strategy by identifying the following three differences:

- Creating value vs. capturing value – the business model focus is on value creation. While the business model also addresses how that value will be captured by the firm, strategy goes further by focusing on building a sustainable competitive advantage.
- Business value – the business model is an architecture for creating an economic value for the business.
- Assumed knowledge levels – the business model assumes a limited environmental knowledge, whereas strategy depends on a more complex analysis that requires more certainty in the knowledge of the environment.

2.1.2. Definition and Application

For a systematic study of business models, we need to define business models and distinguish their different types. But before digging into the definitions of the expression business model, according to Osterwalder et al., (2005) both business and model, by themselves have a specific meaning. They interpret the world model as "a simplified description and representation of a complex entity or process". Representation implying conceptualization, which is described as "the objects, concepts and other entities that are assumed to exist in some area of interest and their inter-relationship according to Genesereth and Nilsson (1987). Putting both these elements together Osterwalder et al., (2005) propose that the reflection on the business model concept must go in the following direction:

"A business model is a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm. Therefore we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences."

In their opinion, the above definition is sufficiently broad to embrace the different reflections on business models that have sprung up in different fields such as e-business, IS, computer science, strategy or management (Pateli and Giaglis, 2003).

A review of the literature using the term business model shows that there exists a continuum between authors using the term to simply refer to the way a company does business Galper (2001), Gebauer and Ginsburg (2003) and authors that emphasize the model aspect Gordijn (2002). These two viewpoints differ because the former generically refers to the way a company does business; whereas the latter refers to a conceptualization of the way a company does business in order to reduce complexity to an understandable level. In other words, for business models, the quest is to identify the elements and relationships that describe the business a company does. Thus, the business model concept can best be understood as a conceptual view of a particular aspect of a specific company.

According to Magretta (2003) a business model in essence, is a theory that is continually being tested in the marketplace. Grasl (2008) defines a business model as

a set of assumptions about how an organization will perform by creating value for all the players on whom it depends, not just its customers.

According to Amit & Zott (2001) in their search for wealth creation, one of the main challenges of entrepreneurs/organizations is the identification or creation of wealth producing opportunities, and the ways to profitably capture these opportunities in an uncertain environment. To do so, entrepreneurs/organizations design a business model, namely the ways their new business is going to transact with, and relate to suppliers, customers, and partners. They view the business model as depicting "the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities." The above indicated authors along with Magretta (2002), Ghaziani and Ventresca (2002) recognize business model design as a crucial task for entrepreneurs.

Malone et al., (2006) offer an operational definition, based on two fundamental dimensions of what a business does. The first dimension considers what types of rights are being sold, arrived at after classifying a business as Creator, Distributor, Landlord, or Broker. The second dimension considers what type of assets is involved. In this case, they distinguish among four important asset types: physical, financial, intangible, and human. According to them a combination of the indicated two dimensions leads to sixteen detailed business models.

Timmers (1998) defines a business model as including an architecture for the product, service, and information flows, a description of the benefits for the business actors involved, and a description of the sources of revenue.

Tapscott, et al., (2000) focus on the system of suppliers, distributors, commerce service providers, infrastructure providers, and customers, labelling this system the business web or "b-web." They differentiate business webs along two dimensions: control (from self-control to hierarchical) and value integration (from high to low).

Weill and Vitale (2001) include "roles and relationships among a firm's customers, allies, and suppliers, major flows of product, information, and money, and major benefits to participants" in their definition of a business model. They describe eight atomic e-business models, each of which can be implemented as a pure e-business model or combined to create a hybrid model.

Rappa (2003) defines a business model as "the method of doing business by which a firm can sustain itself" and notes that the business model is clear about how a firm generates revenues and where it is positioned in the value chain.

Other definitions of business models emphasize the connections a business model provides between technical potential and the realization of economic value (Chesbrough and Rosenbloom, 2002), the design of the transactions of a firm in creating value (Amit and Zott, 2001), the blend of the value stream for buyers and partners, the revenue stream, and the logical stream (the design of the supply chain) (Mahadevan, 2000), and the firm's core logic for creating value (Linder and Cantrell, 2000). In an attempt to integrate these definitions, Osterwalder, et al., (2002) proposes an e-business framework with four pillars: the products and services a firm offers, the infrastructure and network of partners, the customer relationship capital, and the financial aspects.

Common to all of these definitions of business and e-business models is an emphasis on how a firm makes money. Magretta (2002) argues that the strength of a business model is that it tells a story about the business, focusing attention on how pieces of the business fit together—with the strategy describing how the firm differentiates itself and deals with competition. The idea of business model is also consistent with the work on interdependencies (Levinthal, 1997).

In summary, the definitions for business models range from generic (Magretta, 2002; Petrovic et al., 2001) to more concrete ones (Timmers, 1998; Weill & Vitale, 2001; Osterwalder & Pigneur, 2002). Thus, we can find definitions that explain what the purpose of a business model is, while other definitions focus on specifying its primary elements, and possibly their interrelationships.

Considering and amalgamating the various definitions for business models in the literature, this study defines it as:

"A business model is an essential conceptual structure that contains a set of elements (critical success factors) and their relationships that allows expressing an organization's unique strengths required to attain business success."

It is also a description of the value an organization offers to its stakeholders, its network of partners for creating, marketing and delivering this value, the inherent architecture of the firm and the relationships between these that affect the organization's business performance or success.

2.1.3. Generic Business Model – Life Sciences BPO Industry

As explained in Chapter 1, affordable information technology innovation and advancement specially in the internet domain has triggered the phenomenon of organizations attaining business competitiveness through outsourcing. Due to this phenomenon of outsourcing business processes, triggered by advances in information technology advancements there has been an increase in the possible business configurations a company can adopt because of the reduced coordination and transaction costs (Williamson, 1975).

In other words, organizations can increasingly work in partnerships, offer joint value propositions, build-up multi-channel and multi-owned distribution networks and profit from diversified and shared revenue streams. The downside of this is that a company's business has more stakeholders, becomes more complex and is harder to understand and communicate. If this assumption is true one can argue that the existing management concepts and tools may not be sufficient anymore and that new ones have to be found. For example, Rentmeister and Klein (2003) call for new modelling methods in the domain of business models. Effectively, a whole range of authors propose using the relatively new concept of business models for managing companies in this new business era (Chesbrough and Rosenbloom, 2000; Afuah and Tucci, 2001; Applegate, 2001; Pateli and Giaglis, 2003).

This research study is part of this new research stream on business models and focuses on a specific area not covered so well until now: specifying, conceptualizing business models, understanding the effect of business models on business performance. Most business model research stays at a non-conceptual, broad and sometimes even vague level and hence this work tries to dig into the details and define a generic model to describe business models and their effect on business performance / success. This approach becomes indispensable if one wants to provide

effective business model framework to improve, manage business performance/success in a rapidly moving, complex and uncertain business environment of the Life Sciences BPO industry domain.

Based on the above, for the creation of a generic business model or framework which would define the elements and their relationship affecting business performance of the Indian Life Sciences BPO Industry, the work of Ushold and King (1996) was referred to and adapted. In the general the outline for the process was:

- Identification of the key elements (constructs or elemental critical success factors) and their relationships in the domain of interest (i.e. scoping the domain of business models)
- Production of precise unambiguous text definitions for such elements, concepts and or relationships
- Identification of terms and themes to refer to such concepts and or relationships
- Agreeing on all of the above

A partial outcome of this research is a generic business model framework specific to the Life Sciences BPO industry that shall ideally represent the foundation for new management tools in business performance assessment and business strategy.

2.1.4. Business Model Constructs

Constructs or elements or concepts or critical success factors form the vocabulary of a domain. They constitute a conceptualization used to describe problems within a domain. A model is a set of propositions or statements expressing relationships among constructs. Models represent situations as problem and solution statements whereas a method is a set of steps (guidelines) used to perform a particular task.

Methods are based on a set of underlying constructs (elements) and a representation (model) of their relationships in a particular domain.

March and Smith (1995) identify "build" and "evaluate" as the two main issues in constructing a model. Build refers to the construction of constructs, models and

methods demonstrating that they can be constructed. Evaluate refers to the development of criteria and the assessment of the output's performance against those criteria. Parallel to these two research activities March and Smith add the natural and social science couple, which are theorize and justify. This refers to the construction of theories that explain how or why something happens. Justify refers to theory proving and requires the gathering of scientific evidence that supports or refutes the theory.

Summarized, constructs, models, and methods are built to perform a particular task. These outputs then become the object of study, which must be evaluated scientifically. They have to be evaluated in order to conclude if any progress has been made. In order to do this, we have to develop metrics and measure the outputs according to those metrics. For instance, when an artefact has been applied in a specific environment, it is important to determine why and how the artefact worked or did not work - theorize. Then, given a generalization or theory we must justify that explanation by gathering evidence to test the theory in question. Justification generally follows the natural science methodologies governing data collection and analysis.

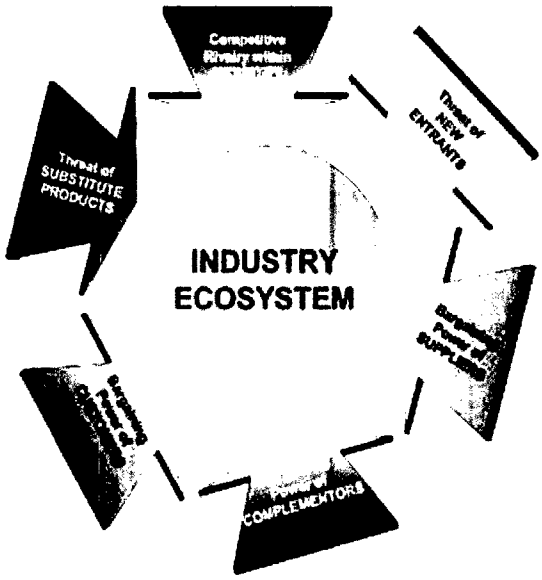
According to Rugman and Verbeke (2000), the "five forces model" for industry analysis (Porter, 1980) is a standard tool used by both academics and practitioners when conducting strategic management studies.

Porter (2004) puts forth that competition in an industry is rooted in its underlying economic structure and goes well beyond the behaviour of current competitors. He also proposes that competition in an industry depends on five basic competitive forces – Bargaining Power of suppliers, customers, Threat of new entrant, Threat of Substitutes, and Industry Rivalry (key structural features of the industry). This framework provides a structural analysis mechanism which is the fundamental step and a key building block in diagnosing industry competition in any country or in an international market.

An important extension to Porter's work is found in the work of Brandenburger and Nalebuff (1995) in the mid-1990s. Using game theory, they added the concept of complementors (also called "the 6th force" a term which was coined by Andrew Grove, former CEO of Intel), helping to explain the reasoning behind strategic alliances.

Complementors are a very visible and influencing force in the globalized, competitive arena due to their inherent nature of "synergic value addition" to the core product or services of a supplier. It is a term used to describe businesses that sell a product/s or service/s that complement the product or service of another organization by adding value to them; for example, Intel and Microsoft (Pentium processors and Windows). Figure 2.1 depicts a visual representation of the "Six Forces Model" given below.

Figure 2.1 - The "Six Forces Model"

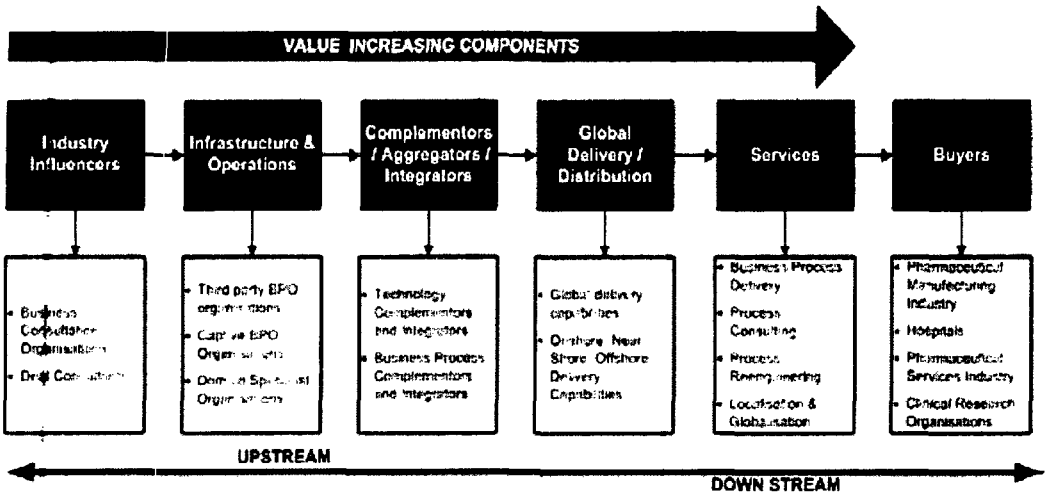


This approach was used along with others described below to have an initial insight into the constructs which influence business performance of the Life Sciences BPO Industry. On applying this analysis it was determined that – threat of substitutes are low, threat of new entrants is low due to high entry barriers, exit barriers are also low and competitive rivalry within the industry is also low since each of the player in this industry is still trying out various strategies and hence rules of engagement are not yet clearly defined.

Coupling this with a relatively higher bargaining power of suppliers compared to bargaining power of buyers and low bargaining power of complementors, we can conclude that, at this point in time, the Life Science BPO industry environment exhibits and facilitates a highly sustainable, high profitability scenario and is a very attractive segment for incubating new businesses, creating Pharma focused industry segments or creating new profitability, business models.

According to Shank & Govindarajan (1993) value chain analysis is undertaken in order to understand the behavior of costs and the sources of differentiation in an industry segment. The value chain framework is an approach for breaking down the sequence (chain) of business functions into strategically relevant activities through which utility / value is added to products and services. On completion of this analysis, the following structure represented under Figure 2.2 presented below can be constructed.

Figure 2.2 - Life Sciences BPO industry value chain and Market map



Further, as an extension to the value chain analysis Matthias and Frits (2001) tend to answer in their paper "Successful Build-to-Order Strategies Start with the Customer" the question – How holistic value chain strategies can be leveraged to enhances responsiveness to customer requirements/needs? and thereby argue that it is essential to see value creation as multidirectional rather than linear. Hence Frits and Matthias (2006) propose the notion of a "value grid" which has a multidimensional approach compared to the linear approach which the value chain analysis takes to understand the various value adding components, systems and their relationships.

2.1.5. Business Model Design Themes

Configuration theory provides a useful basis from which to evaluate different business model designs by considering holistic configurations, of design elements (Miles and Snow, 1978; Mintzberg, 1979). Configurations are constellations of design elements that commonly occur together because their interdependence makes them fall into

patterns (Meyer, Tsui and Hinings, 1993). The design elements of a business model are the content, structure, and governance of transactions that serve the focal firm to pursue, and exploit business opportunities. In this study, we follow Miller's (1996) suggestion to study configuration as a variable rather than as a deviation from an ideal type (Doty, Glick, and Huber, 1993). Miller (1996) states that, "Configuration...can be defined as the degree to which an organization's elements are orchestrated and connected by a single theme".

2.2. Critical Success Factors (CSFs)

Spector (1992) recommends that researchers should first clearly define the construct /framework/phenomenon based on theory, and then develop items that support the definition, and take a confirmatory approach to validate the theoretical ideas guiding the creation of items. In addition, when working with a complex construct, Spector (1992) also recommends that researchers should partition the construct into several key dimensions to ensure the adequacy of the content domain and develop a scale with multiple subscales by creating items for each separate dimension of the construct.

Spector's (1992) recommendation was implemented by utilising the method of Critical Success Factor identification and analysis was utilised to identify, categorise and depict the relationships between these Constructs or elements or concepts or critical success factors which influence business performance of organizations in the Life Sciences BPO Industry.

Critical success factors (CSFs) have been used significantly to present or identify a few key factors that organizations should focus on to be successful. As a definition, critical success factors refer to "the limited number of areas in which satisfactory results will ensure successful competitive performance for the individual, department, or organization" (Rockart and Bullen, 1986). In Rockhart's (1979) seminal work surrounding CSFs from the viewpoint of chief executives, he states that the process of identifying CSFs helps to ensure that those factors receive the necessary attention. He further proposes that the procedure allows for clear definition of the type of information that the company needs and moves away from the trap of building a

system around data that are easy to collect. Rockhart's (1979) work was based on research by D. Ronald Daniel, who was, according to Rockhart, the first person to discuss "success factors" in the management literature.

In Rockhart's view, CSFs were those specifically distinguished areas that an organization needed to "get right" in order for the business to successfully compete. Based on this, identifying CSFs becomes critical as it allows firms to focus their efforts on building their capabilities to meet the CSFs, or even allow firms to decide if they have the capability to build the requirements necessary to meet CSFs and hence control business performance rather than the other way around.

Success factors were already being used as a term in management when Rockart and Bullen reintroduced the concept to provide greater understanding of the concept and, at the same time, give greater clarity of how CSFs can be identified. CSFs are primarily tailored to a firm's particular situation as different situations (e.g. industry, division, individual) lead to different critical success factors. Rockart and Bullen presented five key sources of CSFs: the industry, competitive strategy and industry position, environmental factors, temporal factors, and managerial position (if considered from an individual's point of view).

While Rockart and Bullen define the structured interview as the key method for identifying CSFs at the individual level, there are other methods that have been used and have been found to be effective in identifying them. These other methods have been identified as action research, case studies, Delphi technique, group interviewing, literature review, etc. Also, in selecting names to identify each category, an attempt should be made to make the name graphic enough to allow the reader to determine its referent.

According to literature, for the organization pursuing the CSF method, the foundation for writing good CSFs is a good understanding of the environment, the industry and the organization. In order to do so, this requires the use of information that is readily available in the public domain. Externally, industry information can be sourced from industry associations, news articles, trade associations, prospectuses of competitors, and equity/analyst reports. Other sources which would be helpful are interviews with

buyers and suppliers, industry experts and independent observers. These would all be helpful in building knowledge of the environment, the industry and competitors.

Extensive search and review of a large number of journals, publications, industry reports using keywords identified in a preliminary literature review was undertaken to identify CSF's specific to the study. Successive rounds of article abstract reviews resulted in identifying quite a number of articles that could guide the development of a theoretical definition of the Business Model construct – in general. But there were only a few articles which could guide the development of a theoretical definition of the Business Model construct specific to the Life Sciences BPO industry. Table 2.1 given below presents an overview of the literature review protocol.

Table 2.1 - Literature Review Protocol

Sl.	Particulars	Description
1.	Purpose	• To identify existing Business Model Elements, Business Models, dependence of Business Performance on Business Models – if any in the Indian Life Sciences Business Process Outsourcing (BPO) Industry
2.	Search Strategy	• Search by specific keywords • Duplicate references from the search were discarded • Potential cross-references including not only journal articles but also books, books chapters, conference papers and working papers were identified whilst reading these articles
3.	Exclusion Criteria	• An article will be excluded from the systematic review if the following criteria is met : ▪ The majority of the article does not address the above identified purpose
4.	Keywords	• "Business Model Elements", "Business Models", "dependence of Business Performance on Business Models", "Indian Life Sciences Business Process Outsourcing (BPO) Industry", "Critical Success Factors", "Critical Success Factors in Life Science industry", "Critical Success Factors in Pharma/Biotechnology/Clinical Research industry" and a combination of these
5.	Databases	• ABI / ProQuest • EBSCO – Business Source Complete

Although quite a bit of work is being conducted under this area of research as exemplified by the works of Xu et al., (2002); Soh et al., (2000); Ribbers and Schoo (2002); Scheer and Habermann (2000); Esteves-Sousa and Pastor-Collado (2000); Bingi et al., (1999); Al-Mashari et al., (2003); Hong and Kim (2002); Somers and

Nelson (2001); Umble et al., (2003) there exists no reference to the critical success factors affecting the Life Sciences BPO Industry.

The observation that there has been no research conducted to date that has a direct impact on the topic under study, - the effect of business models on business performance, is a significant finding. To overcome this limitation, an initial pilot study with a focused sample of professionals from the life sciences BPO industry was undertaken. Details of the studies undertaken, the process and the results of these studies are presented under section 3.10 (Chapter 3).

2.3. Organization performance

One of the central functions of entrepreneurship and hence the organization is wealth creation. According to Knight (1921), entrepreneurs create wealth by purchasing resources at a price that is lower than their future value, which is uncertain at the time of purchase. Entrepreneurs are thus focused on the discovery and exploitation of opportunities for the creation of future goods and services (Shane and Venkatraman, 2000; Venkatraman, 1997).

However, recent work has begun to address the role of planning-related activities (Delmar and Shane, 2002; Magretta, 2002; McGrath and Macmillan, 2000), in particular that of design-related tasks (Van de Ven et al., 1984; Hargadorn and Yellowlees, 2001) as part of the organizational process.

In this study, we build on this emerging literature to examine the impact of business model design on the performance of entrepreneurial firms or organizations.

Organizational performance has been used widely as the most important criterion in evaluating organizations; however, researchers often pay little attention to what performance is and how it is measured (Richard et al., 2008).

There are several challenges researchers must overcome when attempting to measure organizational performance. First, organizational performance is multidimensional which makes it difficult to effectively understand its structure, scale, and scope (Devinney et al., 2005).

Next, the relationships between variables of interest (such as business model in this case) and performance can be influenced by other measures the organization uses internally and how they alter managerial decisions and actions (Devinney et al., 2005). Moreover, organizational performance varies over time and it is unclear which measures vary in which ways (Devinney et al., 2005). In addition, there are practical issues concerning which measures should be used (e.g., whether subjective vs. objective measures or financial vs. non-financial measures) (Devinney et al., 2005).

Although associated with the above indicated limitation, organizational performance is the ultimate dependent variable of interest for researchers concerned with just about any area of management. This broad construct is essential in allowing researchers and managers to evaluate firms over time and compare them to rivals. In short, organizational performance is the most important criterion in evaluating organizations, their actions, and environments.

March and Sutton (1997) found that of 439 articles in the Strategic Management Journal, the Academy of Management Journal and Administrative Science Quarterly over a three year period, 23% included some measure of performance as a dependent variable. In contrast to the dominant role that organizational performance plays in management fields, is the limited attention paid by researchers to what performance is and how it is measured.

In 1985, Rawley and Lipson examined the relationships among several combinations of performance measures to demonstrate that different common measures of financial performance did not represent the same attributes. Of these comparisons, the only overall performance measures that they found to be related to each other at statistically significant levels were the Q ratio versus cash flow return on investment ("CFROI") adjusted for the Capital Asset Pricing Model ("CAPM") discount rate, and market-to-book value versus return on investment adjusted for inflation.

The Q ratio was proposed by Callard and Kleinman (1985) as a substitute for Tobin's Q, and is calculated as the ratio of the value of individual business units divided by the inflation adjusted purchase cost of assets. The other measures that they compared were clearly discriminant and do not measure the same construct.

Chakravarthy (1986) empirically compared seven exemplar firms with seven "maladapted" firms in the computer industry, as determined by corporate reputation. The criteria for selecting the samples were the criteria proposed by Peters and Waterman (1982) for "excellent" firms. Chakravarthy hypothesized that the means of the two groups, excellent and non-excellent firms, would differ along common measures of performance.

Accordingly, those measures of performance that demonstrated that the means of the two groups were statistically significantly different would be the best measures of performance for use in strategic management research.

The importance of this research was that no single profitability measure was capable of discriminating between the two groups of computer firms. This applied to both the accounting measures used and the market-based measure. As strategic performance deals with the future, Chakravarthy proposes that a firm needs slack resources to ensure its flexibility. Accordingly, in assessing strategic performance, the ability of a firm to produce slack resources is critical.

Brush and VanderWerf (1992) examined thirty-four different studies in the entrepreneurship literature that explicitly used firm performance as the dependent variable.

They found that thirty-five different measures of performance were used in those studies indicating that researchers perceived many different dimensions of performance, and that there was no agreement on what measures actually represent overall organizational performance. The most frequently used measures of performance were changes in sales, organizational survival, changes in number of employees, and profitability.

Multiple objective measures were much more frequently employed than were subjective or perceptual measures of performance. Further, the primary means of data collection was mail surveys, and the primary sources of performance information were managers, executives, founders or owners.

Robinson (1995) examined ten different new venture performance measures to determine which individual measure was the most effective in accurately assessing

long-term economic value creation. Each of the performance measures were calculated for the three-year period following the firms' initial public offerings. A sample of 199 new ventures that had issued an initial public offering prospectus between 1980 and 1987 were used as the basis of the analysis.

The ten measures studied were (1) change in sales, (2) sales level, (3) return on sales ("ROS"), (4) return on invested capital ("ROIC"), (5) return on equity ("ROE"), (6) return on assets ("ROA"), (7) net profit, (8) earnings before interest and taxes ("EBIT"), (9) earnings multiples, and (10) shareholder value created. Robinson found strong support for his hypothesis that **return to stockholders provided the most power of the ten measures evaluated** in corroborating previously established relationships between the influence of new venture strategy and the joint influence of new venture and industry structure on the economic performance of new ventures. Robinson noted that these results corroborated the prior findings of Ball and Brown (1968) and Lev and Ohlson (1982).

Murphy, Trailer and Hill (1996) examined the variables used to measure organizational performance in entrepreneurship research in the years 1987 through 1993. They identified 51 articles published in Academy of Management Journal, American Journal of Small Business, Entrepreneurship Theory & Practice, Journal of Business Venturing, and Strategic Management Journal that explicitly used firm performance as a dependent variable.

They found, consistent with Brush and VanderWerf (1992) and Cooper (1993), that there was no consistency in the variables used to measure new venture performance. In total, they identified 71 different dependent variables used to measure performance in their sample. They subsequently categorized these variables into eight separate dimensions of performance. They also found that 75% of the sample articles used primary data sources, 29% used secondary data sources, and only 6% used both. The high dependence upon primary data sources is typical in Entrepreneurship research, since there are generally no publicly available financial data sources for non-public companies. Another finding was that the performance variables used were primarily financial rather than operational.

Four primary categories of performance are depicted below since there is no authoritative list of performance categories in the prior literature, the categories of performance measures discussed in this chapter are based upon general classifications of performance measures often found in finance and accounting texts (Brealey, et al., 2001; Helfert, 1994; Higgins, 1995; Penman, 2001).

The primary variables used in research and practice to represent the overall organizational performance construct can be categorized into several distinct groupings. The four primary categories of overall organizational performance variables used in recent empirical research identified above include (1) accounting measures, (2) operational measures, (3) market based measures, and (4) survival measures. In addition, measures of economic value creation are popular in practice but are not frequently used in strategic management or entrepreneurship research.

ACCOUNTING MEASURES: Accounting measures are those that rely upon financial information reported in income statements, balance sheets, and statements of cash flows. Accounting measures can be further subcategorized into profitability measures, growth measures, leverage, liquidity, and cash flow measures, and efficiency measures.

Profitability Measures: Profitability measures include values and ratios that incorporate net income or a component of net income such as operating income or earnings before taxes. It is through the generation of a profit that an organization is able to provide a return to providers of equity capital, once the profits have been converted into liquid assets. In the absence of profits or the likely prospect for profits, equity capital providers will withdraw their resources from an organization and redeploy them to alternative investments where a positive return can be realized.

Growth Measures: Growth measures include values and ratios that present some indication of organizational growth. Growth has been conceptualized both in the context of resources and from a business operations perspective. Typical accounting-based growth measures include absolute or percentage change in total assets, operating assets, sales, total expenses, and operating expenses.

Leverage, Liquidity, and Cash Flow Measures: Leverage, liquidity, and cash flow measures include values and ratios that represent the organization's ability to meet its

financial obligations in a timely manner and provide a cash return to capital providers. The ability to meet financial obligations can be measured both by the ratio of liquid assets to liabilities, and/or by the organization's ability to generate sufficient cash flow to meet outstanding liabilities.

Efficiency Measures: Efficiency measures include values and ratios that represent how well the organization utilizes its resources. Typical efficiency ratios include asset turnover, net profit per employee, net profit per square foot, sales per employee, and sales per square foot. Clearly, most efficiency ratios require information that comes from outside the three basic financial statements.

OPERATIONAL MEASURES: Operational measures include variables that represent how the organization is performing on non-financial issues. Measuring performance on non-financial dimensions has received renewed attention over the past many years as corporations have adopted a "balanced scorecard" approach for the integration of strategy and performance measurement (Kaplan, 1984; Kaplan and Norton 1992). These variables include market share, changes in intangible assets such as patents or human resources, customer satisfaction, and stakeholder performance. Most of the measures in this category require primary data from management in the form of their assessment of their own performance, which may lead to questions of the validity of the responses.

SURVIVAL MEASURES: Survival measures of performance simply indicate if the organization remained in business over the time period of interest. Barnard (1938) and Drucker (1954) proposed that survival is the ultimate measure of long-term performance. However, since most empirical research in entrepreneurship and strategic management address time horizons five years and less, survival is rarely used as a measure of overall organizational performance.

ECONOMIC VALUE MEASURES: Economic value measures of performance are adjusted accounting measures that take into consideration the cost of capital and some of the influences of external financial reporting rules. These measures have not been used by researchers in strategic management or entrepreneurship empirical studies because the values are not generally reported and most companies do not even

calculate them internally. Typical economic value measures include residual income, economic value added, and cash flow return on investment.

MARKET-BASED MEASURES: Market-based measures of performance include ratios or rates of change that incorporate the market value of the organization. Examples of these variables include returns to shareholders, market value added, holding period returns, Jensen's alpha, and Tobin's Q. The calculation of these variables requires a market valuation for the company and is generally only available for publicly traded companies.

Market-based measures have been hailed as the best possible measures of organizational economic performance (Copeland et al., 2000; Rappaport, 1986; Robinson, 1995). They have also been criticized (Bromiley, 1990).

There are several key arguments in favour of market-based measures. First, they include the value created by both the execution on existing opportunities, as well as the risk adjusted expected value of future opportunities that have yet to be realized.

Second, and perhaps more important, the issues with accounting-based measures do not affect stockholder returns (Brush et al., 2000), since accounting measures are subject to manipulation by management while a well regulated market is generally not subject to manipulation.

Third, if one accepts the assumption that markets are relatively efficient (and this is still a matter of considerable scholarly debate), market-based measures quickly reflect management actions and changes in the economic value of the organization. Also, since the value of past actions are also quickly incorporated into the market value of the organization, the change in market value during a given period can be assumed to reflect the actions taken by management and changes in general market conditions during that specific time. In contrast, changes in accounting-based measures may lag managerial actions by considerable periods, which introduces problems for researchers since intervening events with shorter time lags between action and effect may also act on accounting-based measures during the lag period in question.

Criticisms of using market-based measures are also numerous. First, under efficient market theories, changes in returns to capital providers in excess of the weighted

average cost of capital of the organization are considered surprises to the market. If the market anticipates an organization's sales and profit growth correctly, then the risk adjusted present value of these expectations are already incorporated into the market value of the organization (Bromiley, 1990). While this assertion is true, it seems intuitive that entrepreneurship and strategic management researchers are looking for exactly this information. Specifically, the changes in market value that researchers are interested in are those that are created by the new actions of management.

The only way the market could anticipate sales and profitability growth is if there already existed information, based upon actions already taken by the organization's management, which is incorporated in the beginning market value of the organization. Therefore, market "surprises" must result from new information that becomes available to the market. Under efficient market theories, this new information must come from (1) a more complete understanding about the consequences of past management actions, (2) new actions taken by the organization, or (3) changes in the organization's operating environment. Controlling for the external changes in the organization's operating environment should result in capturing the effects of firm-specific actions in the market-based measure.

In finance terms, entrepreneurship and strategic management researchers are interested in unsystematic risk, or the variance in the price of an individual stock that results from unique circumstances of the company, not the market as a whole (Brealey, et al., 2001). Bromiley (1990) argues that strategic managers do not manage stock prices. Managers attempt to influence sales, profits, capital structure, etc. Since the relationship between these individual measures and changes in stock prices is only partially understood, the use of changes in stock prices and the associated concepts of risk are difficult to apply to strategic management research.

Bromiley further argues that stock market returns focus only on the objectives of shareholders. Many strategic management theorists believe that corporations have multiple goals (Cyert and March, 1963; Freeman, 1984).

Conversely, finance theory proposes that the market for corporate control results in management being replaced if they do not act in the best interest of shareholders.

Accordingly, shareholder goals become primary in the management of for-profit firms, and managers must make decisions guided by this principle or risk being replaced. **Therefore, maximizing shareholder value, however shareholders define value, becomes the primary aim of managers.**

Based on above literature research the market based measure returns to shareholders (RTS) was selected in this study to represent business performance. Another reason why this measure was chosen is that ultimately one of the most critical business performance factors is what the shareholder gets for his investment. The corporate governance literature also regards dismissal as the ultimate device to discipline top management Bushman and Smith (2001); Menon and Williams (2008); Volpin, (2002) and also poor RTS as one of the major reasons for the ouster of the CFO of organization.

Dess and Robinson (1984) assert that research involving organizational performance must address two basic issues: (1) selection of a conceptual framework from which organizational performance is defined and (2) identification of valid measures to operationalize organizational performance. In this study we use this approach. The conceptual framework being the value obtained from the generic business model framework for the Life Sciences BPO industry and the valid measure selected will be returns to shareholders (RTS).

2.4. Business Models and Business Performance

Magretta (2002) specifies that a business model should answer the following questions: Who is the customer? What does the customer value? How do we make money in this business? What is the underlying economic logic that explains how we can deliver value to customers at an appropriate cost?

Müller-Stewens and Lechner (2005) adopt the following viewpoint: "A business model defines how a firm's particular configuration of the value chain is made concrete through adoption of a "capitalization perspective", thereby answering the question "How do we make money in this business?": The business model bridges the gap to operative management by answering the questions: Which services shall be

offered to which customers? How and within which structure shall these services be offered? How do I win, foster and keep appropriate customers? How shall the revenue model be defined concretely?"

Considering the above, it becomes imperative that ultimately a business model should demonstrate a relationship to business performance. Although the most preferable or anticipated outcome should be in the positive direction, a negative outcome based on this relationship would give the organizations a strategic direction on the way forward to move the direction of business performance outcome from a negative to positive one.

The next obvious step during this phase of the study was to survey the literature to identify articles/studies which could throw light on the question of relationship between business models and business performance. Continuing in this direction yielded the following studies and their conclusions.

Different theories have been proposed, to explain the difference in performance among organizations, many of which are aligned with either the "industry view" or the "firm/organizational view".

The "industry view" suggests that industry factors, such as market size and barriers to entry, form the most important explanation for why organizations exhibit different performance (Porter, 1980). The "firm view" argues that a firms' endowments and capabilities, and the difficulty of replicating these, are why firms exhibit performance heterogeneity (Wernerfelt, 1984).

The empirical literature focuses on disentangling the industry and firm explanations of performance heterogeneity. (Schmalensee, 1985), using 1975 data on lines of businesses and reports that industry explains 20% of return on assets (ROA) heterogeneity, while firm – using market share as a proxy – has negligible explanatory power.

Rumelt, (1991) uses four years of Federal Trade Commission data and a composite measure of firm effects. Unlike Schmalensee, he reports that firm (business unit) effects account for 34 to 46% of explained ROA heterogeneity while industry effects account for only 8 to 18%, of which about half of this is transient, as measured by the

interaction of industry effects with year effects. Rumelt also includes a corporate-parent effect and finds that it is negligible. This is interpreted as consistent with the firm view: corporate strategy that structures industry and positions a firm within that industry does not matter, Carroll (1993), Ghemawat et al., (1993); Hoskisson, (1993).

Roquebert et al., (1996), Brush et al., (1997), McGahan et al., (1997), Chang et al., (2000) and Bowman et al., (2001) along with many others evaluate the robustness of Rumelt's findings. Other papers agree that firm effects dominate industry effects Agrawal et al., (1991), Amit et al., (2001), Lubatkin et al., (2001), Mauri et al., (1998), McNamara et al., (2003), Powell (1996), Ruefli et al., (2000), Vilmos et al., (2006), Walker et al., (2002), but see some differing opinions in Hawawini et al., (2005), McNamara et al., (2005).

There is also an important branch of the empirical literature, Denrell (2004), McGahan et al., (1999), that argues that it is "persistence" that is important, and on this measure, industry effects dominate.

According to Kaplan et al., (2004), Tapscott et al., (2000), Timmers (1998) and Slywotzky et al., (1997), a very different explanation, in the form of "business model," is commonly offered for why some firms do better than others.

Amit and Zott (2001) identified critical dimensions of business model design, which they refer to as design themes, and by measuring and quantifying these dimensions, they showed that: (i) business model design matters to the performance of entrepreneurial firms, and (ii) business model design themes have a differential impact on performance under varying environmental conditions. They also discuss on how their research relates to the findings on the effect of novelty, efficiency, and their interaction on firm performance by researchers focusing on different levels of analysis.

Their analysis highlights the business model as an emerging unit of analysis for entrepreneurship and management research and also provide empirical support for the suggestion that the design themes of a firm's business model are determinants of performance. They are also clear in stating that business models complement, but do not replace, firm specific and industry specific effects on firm performance (Rumelt, 1991; McGahan and Porter, 1999; Hawawini et al., 2005).

They also offer the following important implications for practitioners:

- Corroborate the premise that in a highly interconnected world enabled by advances in information and communication technologies, entrepreneurs, and entrepreneurial managers alike may consider looking beyond firm and industry boundaries in order to create and capture business opportunities.
- In order to succeed, entrepreneurs need to not only strike a balance between novel and familiar design elements (Hargadorn and Yellowlees, 2001), but also find the right mix of design themes (i.e., novelty versus efficiency) in the sense that there is a need to adapt the design of a business model to a changing environment.

Some of the limitations indicated in this study include the need to determine the generalizability of their findings for different types of ventures in different industries and for firms at different stages of the venture life cycle. They also indicate that the inclusion of salient business model characteristics, such as design themes, as independent or dependent variables in research on emerging organizations (Aldrich, 1999), offer the unique opportunity to establish a more clearly defined identity of entrepreneurship as an independent field of scholarly inquiry.

Chesbrough and Rosenbloom (2002) investigated the role of the business model in innovation led industries (technology). The biomedical industry survives on innovation and hence this study help us get a better insight into how business models affect innovation. They indicate that discovering a viable business model for these innovations is a critical and neglected dimension of creating value for an innovation lead organization.

They also offer an interpretation that the business model is a construct that mediates the value creation process and translates between the technical and the economic domains, selecting and filtering innovations, and packaging them into particular configurations to be offered to a chosen target market, essentially what happens in the biomedical industry.

They also advocate the need for heuristic logic to discover an appropriate business model for this neglected dimension.

According to Melone et al., (2006) who formulated a fundamental, reliable and practical typological definition of business models, classified U.S. firms (10,419 publicly traded United States firms) at the segment level by business model, and investigated if business models might explain performance heterogeneity, they found that business model effects are larger than year effects. They also dominate industry effects, when industry was measured at the comparative (i.e., one-digit NAICS) level. Their conclusion was robust to very many econometric issues as well as alternative interpretations.

The organizational performance literature also points out the importance of the relationship between non-financial and financial organizational performance and how organizational performance can be justifiably evaluated through perceptual scales. Therefore, organizational performance was operationalized as non-financial performance and financial performance and was measured with existing scales found in the literature (Martinez and Kennerley, 2005; Mausollf and Spence, 2008; Melkers and Willoughby, 2005).

In summary, it becomes clear that there exists a relationship between business models and business performance of organizations. Hence determining a specific business model configuration for the specific organization in a specific industry becomes critical for its survival and success.

It is also evident that there are no industry specific models, frameworks, tools which can be applied to create a business model, study effects of varying individual components on business performance and comparing different organizations with their own unique business models. Hence there is a dire need to create an industry specific generic business model framework which can predict business performance of an organization. This should also provide an option for studying the effect of the model on performance when constituent business model variables are manipulated.

The above sections conclude the review of literature and support the development of this research study.

Chapter 3

Research Methodology

This chapter describes the methods and procedures used to identify existing, common business model design elements and their relationships with reference to the external environment, identify and evaluate Critical Success Factors (CSF's), conceptualize and create an empirical generic / reference business model reflecting their relationship and effect on industry performance.

It describes how this generic / reference business model forms the basis to further compare the effect of business model designs on business performance of firms. It also describes the methods used to collect data for use in answering the research questions and testing the research hypotheses. Finally, the chapter ends with an overview of the data analysis methodologies used to test the research hypotheses.

3.1. Research Gap

On completion of literature review, it became evident that there was a dearth of studies which look into the effect of business models on business performance in the Life Sciences Business Process Outsourcing (BPO) Industry domain. There was also no evidence of research which have studied the effect of business models on business performance in the Indian Life Sciences Business Process Outsourcing(BPO) Industry context.

India being a destination for BPO Services specifically in the Life Sciences Domain (based on contribution of services to the GDP) there exists a huge gap in our understanding of the effects of business models on business performance. There is also a dire need on the availability of a industry specific generic business model framework which can predict business performance.

To fill the existing knowledge gap and satisfy this unmet need, this research study focuses on understanding the effects of business models on business performance in the Life Sciences Business Process Outsourcing (BPO) Industry domain and construct a industry specific generic business model framework which can predict business performance in this specific business domain.

Based on the reviewed literature, it becomes evident that to understand and study the effect of business model on business performance in any industry we need to accomplish the following :

- Identify existing business models
- Identify elements constituting these business models
- Categorise these elements into themes
- Determine the relationship between these elements and hence the themes
- Create a generic business model or theme which is specific to the industry under study
- Evaluate this model using real life examples/samples

At the end of this process we would have generated a robust industry specific generic business model framework which can be utilised to study the effect of business models on business performance/success.

3.2. Research objectives

As previously indicated, very few rigorous empirical studies have been conducted to investigate how business models affect business performance and success, and how business model related elemental variables (Critical Success Factors - CSF) influence this effect. Hence, the primary purpose of this study is:

- To increase understanding of how business models can be constructed through the examination of its underlying processes
- To increase understanding of the relationship between business models and business performance/success by taking into account elemental variables (Critical Success Factors - CSF) associated with the business model

By developing and empirically testing a working theory, this research seeks to provide insight for Life Sciences BPO industry business models, thus, improving overall effectiveness of business models and their impact on business performance/success.

To achieve this purpose, the following major research objectives are addressed:

- Identify, constituent elemental critical success factors of business models in the Life Sciences BPO industry using survey questionnaire instrument through multiple pilot studies.
- Identify a set of themes to classify the above identified constituent elemental critical success factors of business models and operationalize them.
- Propose or construct a generic business model framework based on the identified constituent elemental critical success factors and their relationships affecting business performance.
- Identify a business performance and success outcome measure that relates to organizational performance.
- Using the constructed generic business model framework identify and compare business model relationship to business performance of identified Indian Life Sciences BPO organizations.
- Test association of the relationship between proposed business performance values and factual business performance and success values obtained from the above objective.

Accomplishing these research objectives is expected to contribute both to practitioners, by providing guidelines for creating business models which will enhance business performance/success; and to academic research by providing insight, and direction for future research.

Since, research has the ultimate of developing an organized body of scientific knowledge, this research study is being undertaken in order to gain new knowledge and add to existing knowledge through a documented, data-driven approach to the development of scientific knowledge.

3.3. Research Questions

Given the pervasive reference to business models in the industry and the dearth of rigorous study on the subject, the researcher believes that research on business models and how these affect and enable organizations to achieve improved performance results under different conditions can contribute greatly to the current body of knowledge. Although this research seeks to represent the proof of causal relationships

between business models and business performance/success, it does not attempt to answer deeper questions about why the performance implications exist.

Based on the above, one primary research question to be addressed in this research is :

- How does business model design affect business performance in the Life Sciences BPO domain ?

This primary research question in turn gets translated into four sub-questions as follows:

- What are the existing business model design elements in the Indian BPO context ?
- How can business models be described and represented in order to conceptualize, define and build reference or generic business model framework ?
- Can this generic business model framework be used to identify and compare existing business models OR Can an efficient business model design be determined by comparing models of different Indian BPO firms ?
- How can a specific business model with value constellations be built for the BPO domain ?

3.4. Research Hypotheses

To achieve the objectives of this research, the following initial hypotheses were investigated. These hypotheses were developed based on the requirement of the study in answering the research question/s.

- Null hypothesis (H_0) : An organizations' business performance is independent of its business model.
- Alternate hypothesis (H_A) : An organizations' business performance depends on its business model.

Due to dearth of research studies, the research was designed in such a way that on identifying elemental CSF's, themes and exposing the respondent data set to exploratory factorial analysis, working hypothesis could be formulated depending on the factor solution obtained after EFA. Based on the obtained four factor solution (post EFA), we arrived at the following set of working hypothesis (Null(H_{0n}) and Alternate (H_{An}) where n = 1, 2,.....x) :

- H_{01} : An organizations' business performance is independent of "Customer Factor".
- H_{A1} : An organizations' business performance depends on its "Customer Factor".
- H_{02} : An organizations' business performance is independent of "Organization Factor".
- H_{A2} : An organizations' business performance depends on its "Organization Factor".
- H_{03} : An organizations' business performance is independent of "Industry/Sectoral Factor".
- H_{A3} : An organizations' business performance depends on its "Industry/Sectoral Factor".
- H_{04} : An organizations' business performance is independent of "Environmental Factor".
- H_{A4} : An organizations' business performance depends on its "Environmental Factor".

Since the study was designed to compare two rank variables to measure the strength of association between business models and business performance, or lack of it, the following working hypothesis was also tested.

- H_{05} : There is no association between model based ranks and RTS based ranks of an Indian Life Sciences BPO organization.
- H_{A5} : There is association between model based ranks and RTS based ranks of an Indian Life Sciences BPO organization.

3.5. Research Design

There is limited research that have studied the relationship between business models and business performance and success, especially in the Life Sciences BPO industry domain. Based on this, the study was designed to start with an initial limited exploratory design (LED) phase and then move into the conclusive research design (CRD) phase. The empirical investigation through survey research was intended to improve generalizability of the analysis of the interrelationship between business models and its impact on business performance.

The initial, limited exploratory research design (LED) phase was adopted due to the need for rich data that could facilitate the generation of theoretical categories that could not be derived satisfactorily from existing data (Locke, 2001). In the LED phase secondary data was utilized initially to identify at least some of the elemental CSF's. Since this identified very few elemental CSF's, it was followed with collection of primary data through five pilot studies.

Data from this stage was used to identify elemental critical success factors (CSF) of business models in this domain and categorize them into themes. This formed the basis for creating the survey instrument which was used in the next stage of the study (large scale research survey). The final survey instrument with 46 elemental CSF's and 8 themes was arrived at after content validity and reliability analysis.

In the CRD phase, the causal research design was utilized to collect primary data through a large-scale research survey. Data was collected using a web-based survey questionnaire response system through organizational informants who participate in their organization's outsourcing initiative in various roles. Based on data obtained through this large scale survey, the 8 themes with their constituent elemental CSF's were reduced using exploratory factor analysis (EFA) to yield a more manageable four factor solution based on the relationships between these elemental CSF's.

The study was also designed to collect business performance metric data in the form of returns to shareholders (RTS) which was calculated from organization specific financial data collected using secondary sources. This business performance data and the four factor solution were used to construct a generic business model framework for Life Sciences BPO organizations.

The last and final Comparative study phase of this study was designed so that, primary data was collected through a limited survey using a set of respondents (working in Indian BPO/CRO Organizations) who were different from those who took part in the large scale research survey study.

Based on total respondent scores, arrived at after applying the individual four factor loading scores to individual survey instrument response, different business models were identified. In summary, 33 business models were identified and organizations were ranked on the total respondent score. Applying the generic business model framework on these 33 identified business models individually, yielded an organization specific business performance metric (predicted RTS). This organization specific predicted RTS value was used to compare the participating Indian Life Sciences BPO organizations. On completion of this phase a total of 21 unique business models were identified.

In the final step, organization specific financial data from secondary sources which quantifies the identified business performance measure RTS were collected for the

above specified Indian companies. The predicted RTS and the actual RTS were also analyzed for any association to determine the robustness of the proposed generic business model framework.

The study also used the quantitative method of analysis based on numerical scoring and grading. To arrive at an appropriate survey instrument and create the generic business model framework with its individual elements a mix of both qualitative and quantitative methodologies were used. To test research hypotheses, related statistical tests for hypothesis testing were applied to appropriate data.

In addition, this research was based on the following assumptions:

- Business models can be developed as a set of related constructs (elemental critical success factors) based on them being identified from the literature or through small pilot studies.
- Field-based survey research is preferable, for studying use of Business models compared to an artificial environment (e.g., lab experiments) in terms of generalizability.
- The sample of companies that participated in the research was a good representation of those adopting and using Life Sciences BPO and the organizational informants had adequate knowledge in the sense that they were practitioners of the process.

3.6. Study Approach

The following Table gives an overview of the approach followed in this study to attain the indicated objective.

Table 3.1 - Overview of study approach

Sl.	Approaches	Objective / Outcome
1.	Literature review	• Identify area of research • Understand existing business models and elemental critical success factors affecting business performance • Identify knowledge gaps and existing needs in the Life Sciences BPO Industry domain – Study purpose • Determine research design and study approach
2.	Pilot Studies (Five)	• Identify existing business models • Identify elemental critical success factors constituting these business models • Categorizing existing elemental critical success factors into themes

Sl.	Approaches	Objective / Outcome
		• Understand relationships between elemental critical success factors and business performance
3.	Survey Instrument development	• Development of Critical Success Factors • Content Validity Assessment and Reliability Study • Creation of a "Reliable" Survey Instrument
4.	Field survey (sample survey)	• Identification of population (theoretical and accessible populations), sampling frame (listing of accessible population from which the sample is drawn), sample (group of people selected for the study) • Purposeful, systematic and rigorous collection of data for data analysis and interpretation
5.	Exploratory data analysis	• Confirm existence of identified elemental critical success factors • Confirm existence of business models • Identify themes for categorizing existing elemental critical success factors • Identify relationships between elemental critical success factors and business performance
6.	Confirmatory data analysis	• Confirm themes for categorizing existing elemental critical success factors • Confirm relationships between elemental critical success factors and business performance • Construct a industry specific generic business model framework
7.	Comparative Study	• Create a comparative list of organizations based on the industry specific generic business model framework • Create a comparative list of organizations based on the business performance metric (RTS) • Evaluate both the lists for association • Confirm industry specific generic business model framework • Compare different business models of Indian Life Sciences BPO organizations based on their business performance

3.7. Population and Sample

The primary objective of this research is to evaluate the impact of Life Sciences BPO industry Business Models on business performance; therefore, outsourcing professionals from Business Outsourcing functions (Customers as well as service providers) at the organizational level are appropriate subjects. These participants are assumed to have direct experience with business process outsourcing and possess knowledge about their organization and service provider/customer performance.

It was determined that the target respondents included in this research must satisfy any one of the following criteria:

a) should be employed in either an independent organization or a strategic business unit within a multiple business organization that outsources business processes

b) should be employed in either an independent organization or a strategic business unit within a multiple business organization that provides outsourced business process services to outsourcing customers
c) should be employed in either an independent organization or a strategic business unit within a multiple business organization in the Life Sciences industry – Pharmaceuticals, Biotechnology, Generics manufacturing, Clinical Research organization, IT services provider to the life sciences industry or BPO service provider to the life sciences industry that outsources business processes.

The criteria were defined to ensure that respondents have the best knowledge about the Life Science outsourcing industry and have direct experience with the outsourcing function and hence were capable of providing useful inputs. Further, as this research aimed to develop a measurement instrument that could be applied in to either private or public organizations, no restriction in types of organizations were applied.

Since there is no readily available database for this population, the purposive sampling frame was originally set to Life Sciences outsourcing organizations across all geographies. Considering the sample size required, costs and disadvantages of postal survey, it was decided that an electronic survey would be more appropriate, given that the target respondents would all have internet access.

The e-mail addresses of the respondents who satisfied the indicated criteria were identified online primarily on the LinkedIn Professional Group "Life Sciences Outsourcing" through the researcher's networks and several outsourcing online networks in LinkedIn to provide the required sampling frames for this study. All the professional groups selected in this study to complete the sample frame had specific entry gate criteria. For example, the LinkedIn group Life Sciences Outsourcing is a regulated group which has an entry gate criterion in the sense that this is an exclusive group for professionals in the outsourcing industry and has around 1495 members.

In summary, the final samples comprised of organizations worldwide and included members of online forums and members of researcher's networks who have the best available knowledge of the life science outsourcing industry and have direct experience with the outsourcing function in the life sciences industry.

3.7.1. Mechanics of Questionnaire Administration

Data was collected by a web-based survey administered to the target participants, similar to the pilot study using the paid version of the online survey tool - SurveyMonkey® (http://www.surveymonkey.com). Web-based surveys are becoming increasingly prevalent in survey research. They are less costly, more convenient, and provide more control than postal surveys (Couper, 2000).

A questionnaire identical in terms of content was adapted and created on the SurveyMonkey® website from the CSF's and Source of CSF developed and exhibited under Table 3-9. The survey was organized into nine sections with the first section, serving as a screening section. This section asked for general information and demographic information of the respondents. The next eight sections focused on the study variables. The participants were required to answer all survey questions. The copy of the questionnaire is provided in Annexure III. Considering the time required to complete the questionnaire (30–45 minutes) and to facilitate survey completion, the respondents were allowed to save their survey responses by specifying the e-mail address to which a continue link could be sent.

The survey was administered in six steps by following the slightly modified methodology defined by Dillman (2000): pre-notification, initial mailing, first follow-up, second follow-up, third follow-up and a fourth and final follow-up through e-mails. In the first, prenotification/solicitation step, a personalized e-mail request for participation in the survey was sent to target respondents, which informed them about the nature and purpose of the research and requested their participation in the survey.

The prenotification included communication about survey purpose, description, source of respondents' contact information, researcher's contact information, a statement about confidentiality of the respondent's response, and as an incentive an option to receive the research summary was also communicated (Dillman, 2000; Simsek, Veiga, and Lubatkin, 2005).

Next, an e-mail message with hyperlink to the online questionnaire was sent to the identified respondents. Respondents were also asked to forward the invitation to the most suitable person within their organization in case they were not familiar with outsourcing. The first e-mail reminder was sent out three weeks after the invitation. The next two follow-up emails were sent two and three weeks apart respectively, after

the first e-mail. The final remainder e-mail was sent to respondents three weeks after the third e-mail. Details of the e-mails sent are enclosed under Annexure IV.

3.8. Data Collection Procedure

3.8.1. Elemental CSF Study Data Collection

Using the described screening process (Section 3.7 Population and Sample), around 2857 potential respondents were identified and online solicitation to participate in the survey were sent. The online survey preparation and conduct was initiated on November 08, 2010 and completed on the 21st of March 2011.

In total, 2857 invitations were sent out to a much focused sample frame and at the end of the survey window, 347 responses were submitted/received. The response rate was 12.15% considering that some of the respondents preferred not to participate or would not have received the e-mail itself due to an active/enabled spam filter in their e-mail program. This response rate for this survey is low due to the fact that the criteria for selecting the sample frame was rigid.

The low response rate was anticipated primarily due to the "survey completion estimated time" which was longer than the recommended threshold of 20 minutes found in the literature and since each study theme (Source of CSF's) was constituted by multiple CSF's (elements). This was a risk which was taken to ensure increased validity of the survey instrument over the potential risk of incurring a lower response rate.

Roughly around 80% of the non-usable submitted surveys were incomplete in responses which sheds light to the fact that the scarce time available for these types of tasks among the respondents compared to the estimated survey completion time might have driven away many potential respondents. Also a number of people may not have participated due to lack of sufficient experience or involvement with the Life Sciences outsourcing process itself.

In summary 243 (71.67%) out of 347 received survey responses were considered for the analysis. This data was then analyzed using exploratory data analysis (qualitative) techniques and exploratory factor analysis to arrive at a four factor solution. This four factor solution identifies elemental critical success factors (CSF's), corresponding

themes of these CSF's and their relationships which influence or affect business performance of Life Sciences BPO organizations.

3.8.2. Data Preparation

On closure of the survey window and completion of the data collection process, survey data was downloaded from the survey website in Microsoft Excel format and combined into a single spreadsheet. The data set was then screened for partial responses, duplicates, eligibility criteria and examined for systematic bias and patterns of missing data. The missing value codes for blank responses were given a value of "000" and added to the data analysis file. Then, each individual response was examined to assess whether the level of missing data in a primary study variable was high. On observing a blank value in this part of the questionnaire, the response was disqualified and hence was excluded from the final analysis data set. Only responses having all their fields completed were considered for the final analysis data set.

As a result of this process, 104 responses were dropped from the final analysis. On inspection of these non-usable responses, a majority of 83 responses showed that they were partial responses to the actual survey questions. 12 of the submitted responses were disqualified since the respondents did not belong to the Life Sciences industry. Each individual response was also examined for survey fatigue, (Farris, 2006) i.e., where respondents become tired and responded to the survey with the same value. The standard deviation of responses across all 46 scale-items in the survey was calculated for each respondent. Nine of the respondents who demonstrated zero variation in all responses – i.e., answered all 46 questions with the same value – were removed from the data set (Table 3.2).

Table 3.2 - Summary of Response Disqualification

Sl.	Particulars	Responses	Percent
1.	Total number of responses dropped from those received	104	100.00
2.	Total number of partial Responses dropped	83	79.82
3.	Total number of Responses dropped due to respondents not belonging to the Life Sciences industry	12	11.53
4.	Total number of respondents dropped due to survey fatigue in their responses	09	8.65

In total, 243 usable responses, out of the 2857 invitations sent remained in the main study data set for final analysis, yielding a usable response rate of 8.50% when compared to the number of invitations sent. Table 3.3 summaries the response rate of each sampling frame and provides a summary for the overall sample size of the study.

Table 3.3 - Sampling frames and Response rates

Sl.	Particulars	No. of Members	No. of Invites Sent	No. of Responses	No. of usable Responses	Percent Response	Percent Usable Response
1	LinkedIn online groups - Life Sciences Outsourcing	986	986	108	78	10.95	72.22
2	LinkedIn online groups - BPO Executives	12,026	212	54	29	25.47	53.70
3	LinkedIn online groups - CRO, CMO and CRAMS	14,832	837	83	57	9.92	68.67
4	LinkedIn online groups - Global Outsourcing	821	374	31	27	8.29	87.10
5	LinkedIn online groups - India Outsourcing	17,119	261	28	22	10.73	78.57
6	Researcher's networks	592	187	43	30	22.99	69.77
	TOTAL	46,376	2857	347	243	88.35	430.04
	Percent		**6.16**	**12.15**	**70.03**		
	Average Percent					**14.73**	**71.67**

3.8.3. Business Performance Parameter Data Collection

Based on literature research the market based measure Returns To Shareholders (RTS) was selected in this study to represent business performance. Another reason why this measure was chosen is that ultimately one of the most critical business performance and success factors, is what the shareholder gets for his investment.

Out of the 243 useful responses received, a total of 117 respondents had indicated either the division in which they were working and or the organization to which they were affiliated. A total of 28 Customer organizations and 18 service provider organizations were selected from the above based on the following criteria, for this stage of data collection :

a) The respondents should have provided the name of their organization

b) The organization is either an independent organization or a strategic business unit within a multiple business organization in the Life Sciences industry – Pharmaceuticals, Biotechnology, Generics manufacturing, Clinical Research organization, IT services provider to the Life Sciences industry or BPO service provider to the Life Sciences industry that outsources business processes.
c) Required financial information of the organization is readily available in public domain.

After selection of the organizations, factual secondary financial data were collected from standard financial resources, financial websites and the specific organizations' website to arrive (calculate) at the business performance metric – Returns to shareholders (RTS) value for the specific organization.

This data was then analyzed using quantitative data analysis techniques (multiple regression analysis, Analysis of variance (ANOVA)), to construct a generic business model framework. This constructed framework depicts the identified essential elemental critical success factors (CSF's), their internal relationships and the effect or influence or relationship of these identified CSF's on the business performance metric returns to shareholders (RTS).

Hypothesis testing techniques were also applied to test and confirm the appropriate hypothesis of this study.

3.8.4. Comparative Study Data Collection

Based on the four factor solution arrived at, after exploratory factor analysis (EFA), a second questionnaire (enclosed under Annexure V) was created by utilizing elemental critical success factors identified. These identified factors were placed in the same sequence as dictated by the four factor solution based on the individual factor loading value of the individual elemental critical success factors.

Essential verbal modification of these elemental critical success factors to ensure a better understanding of each of these elemental factors were only applied for creating this questionnaire for comparative analysis. The verbal modification was strictly enforced to introduce a more sentence based description of individual critical success factors. This was essential since this questionnaire was exposed to a new set of respondents as is, without further categorization under specific themes.

This questionnaire was sent to pre selected organizations and respondents working in those specific organizations which were selected based on the following criteria :

Organization selection criteria :

(1) should be an independent organization or a strategic business unit within a multiple business organization that provides Life Sciences outsourcing business services (Business Process Outsourcing Organizations, Clinical Research Organizations)

(2) registered, listed BPO, CRO companies in India who were willing to provide required financial information

(3) availability of annual reports either through the organizations website or through reliable financial information gatherers (e.g. : Yahoo finance, Bloomberg, Google finance etc.,)

Respondent selection criteria :

(1) should be employed in INDIA in any one of the organizations identified using the above criteria

(2) should be employed in INDIA either in an independent organization or a strategic business unit within a multiple business organization that provides outsourced business process services to outsourcing customers

(3) should be employed in INDIA in either an independent organization or a strategic business unit within a multiple business organization in the Life Sciences industry – Pharmaceuticals, Biotechnology, Generics manufacturing, Clinical Research organization, IT services provider to the Life Sciences industry or BPO service provider to the Life Sciences industry that outsources business processes.

The organization selection criteria were defined to ensure that the researcher would have direct access to unbiased, statutory information to help evaluate business performance based on selected financial parameters. The respondents' criteria were defined to ensure that they have the best knowledge about the Life Science outsourcing industry and have direct experience with the outsourcing function and hence were capable of providing useful inputs.

Considering the sample size required, costs and disadvantages of postal survey, it was decided that an electronic survey would be more appropriate, given that the target respondents would all have internet access.

The e-mail addresses of the respondents who satisfied the indicated criteria were identified online primarily through India specific LinkedIn Professional Groups related to Life Sciences Outsourcing and through the researcher's networks. Mechanics of questionnaire administration followed the procedure defined under the same heading in the section above.

Using the above described screening process, around 45 potential respondents based out of India and working for India based organizations were identified and online solicitations to participate in the survey were sent. The online survey preparation and conduct was initiated on July 4th, 2011 and completed on the 27th of August 2011.

In total, 45 invitations were sent out to a much focused sample frame and at the end of the survey window, 36 responses were submitted/received. The response rate was 73.35 % as only 33 of the received responses were considered usable since 3 incomplete responses were lost to follow-up. The response rate for this survey is high due to the fact that the sample size was small and there was a vigorous follow-up through personal calls to ensure the survey was completed and returned.

Based on total respondent scores, arrived at after applying the individual four factor loading scores to individual survey instrument response, 33 different business models were identified. Applying the generic business model framework on these 33 identified business models individually, yielded an organization specific business performance metric (predicted RTS). This organization specific predicted RTS value was used to compare and create a ranked list of participating Indian Life Sciences BPO organizations.

Of the 33 business models identified, 21 were unique business models in the sense that they had unique respondent scoring values. From the above data the 21 unique business models were analyzed to determine an association between generic business model framework predicted business performance (RTS) and actual business performance based on factual RTS (organization specific financial data from secondary sources).

3.9. Overview of Data Analysis Methods

There are no prior studies or research which established the elements of a business model, significant themes and their relationship to business performance, specifically

in the Life Sciences BPO industry domain. This study is an attempt to understand, the above.

The first step in this research was to identify, through pilot studies the existence of business models and the elements which make up these business models with reference to the Life Sciences BPO Industry. Next an initial model to understand the effect of these identified elements and specified themes on business performance was inferred from responses obtained by administering a structured, validated survey instrument to a focused group of respondents. Next, the validity of the constructs was tested and finally, the overall model was statistically evaluated. This inferred model included the primary constructs of business models and measures of those constructs. This inferred model was then used/applied as a generic framework on 21 different organizations to understand the relationship between business models and business performance.

The results from this research attempts to answer the following five research questions posed under Section 3.3 :

1. What are the existing business model design elements in the Indian BPO context ?
2. How does business model design affect business performance in the BPO domain ?
3. Can an efficient business model design be determined by comparing models of different Indian BPO firms ?
4. How can business models be described and represented in order to conceptualize, define and build reference models or frameworks ?
5. How can a specific business model with value constellations be built for the BPO domain ?

Standard techniques for descriptive statistics, reliability testing, exploratory factor analysis, regression analysis and hypothesis testing were used to achieve the above objectives and are dealt in detail in Chapter 4 – Data Analysis and Discussion.

3.10. Survey Instrument Development

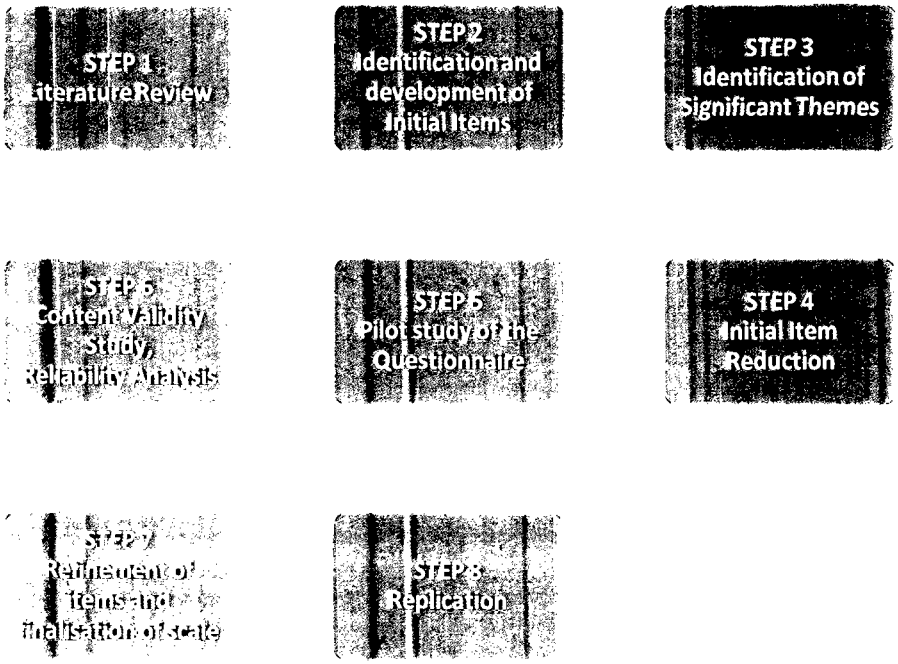
Generally accepted principles of instrument design was used in this research to develop measures of Business Model Elements so that the survey instrument so

generated could identify the critical success factors for India based Life Sciences BPO industry and their relationship to business success or performance. The general six steps procedure laid out by Hinkin (1998) was followed for development of the instrument. The general six steps procedure along with the detailed process followed are represented in (Figure 4.1).

Figure 3.1 - Measurement Development Process

Hinkin's (1998) Proposed Process

Actual Process followed for Instrument Development



The part of the study/process was initiated with a literature review of business model elements and related literature to identify how Business Models use has been previously operationalized. The reviewed literature on business models for the Life sciences BPO industry provides only a limited scope to identify significant themes

and derive satisfactorily theoretical items/categories/components from existing data. Due to this limitation, five pilot studies were undertaken to attain the objective of identifying significant themes and existing items/categories/components of existing business models and their relationships (Step 1). Table 3.2 provides a brief overview of the studies.

Table 3.4 - Studies to identify existing Business Model Elements

Sl.	Study Title	Objective	Identified / Assessed Business Elements	Identified / Assessed Significant Themes
1.	Strategic Analysis of Life Sciences Business Process Outsourcing (BPO) Industry	The objective of this study was to strategically analyse Industry Structure, Business ecosystems and their relationship structures in the Life Science BPO industry in a globalized economy by applying Porter's modified Six Forces analysis, Value chain and Value grid frameworks.	33	06
2.	Global Competitiveness of Indian Life Sciences BPO Industry – An Empirical Study	The objective of this study was to understand the phenomenon of "global competitiveness" from the Life Sciences BPO Industry context, and also evaluate India's global competitiveness in the offshore Life Sciences BPO industry ecosystem by applying an adapted, competitive index measurement framework.	31	10
3.	BPO supply chain strategies for the Life Sciences industry	The objective of this paper was to understand various challenges faced in human resources management in BPO organizations in terms of recruitment, training & development, retention and propose solutions to overcome these critical challenges.	25	6
4.	Strategic framework for creating a Life Sciences centric BPO Business Model	The objective of this study was to understand the life sciences industry and the phenomenon of "global competitiveness" from the Life Sciences BPO Industry context, identify and evaluate "Critical Success Factors" which are strategically essential to create and sustain a offshore centric Life Sciences BPO business model.	32	4
5.	HR Challenges in Business Transformation Outsourcing	The objective of this paper was to gain a deeper understanding about HR challenges being faced in Business Transformation Outsourcing and offer appropriate solutions to overcome them.	8	4

Overall, the above indicated studies assessed and identified one hundred and twenty one (121) items/categories/components (Step 2) and twenty six (26) significant themes (Step 3). To provide further support to these assessed significant themes and items/categories/components, some of them were duplicated in multiple studies to understand and validate their grouping, individual effects and relationship on business performance or success. Details of the above indicated studies which helped assess, and identify twenty six (26) significant themes and one hundred and twenty one (121) items/categories/components are provided under Annexure I.

By grouping similar items/categories/components and applying the method of "Critical Success Factors (CSF)" (Rockhart, 1979; Rockhart, 1981; Richard, 2004) on data obtained from the above studies, fifty two (52) items / categories / components / "Critical Success factors (CSF)" (initial survey items) were identified. The CSF's so identified were content analyzed to identify and categorize them under eight (8) significant themes/"Sources of CSF" to guide the development of individual survey items (Step 4). These items served as input to construct the measurement instrument (questionnaire) for a pilot study (Step 5).

In Step 6 the content and reliability of scales were evaluated through reliability analysis and the final Sources of CSF (Eight (8) – significant themes) and CSF's (Forty six (46) – items/categories/components) so obtained were used for data collection in the full study (Step 7).

From data obtained in Step 7 exploratory factor analysis were used to detect possible reduction and further refinement of the measurement items. These identified Factors would ultimately form the generic framework of Critical Success Factors required for business success (performance) of Indian Life Sciences BPO industry.

Finally, confirmatory factor analysis of revised scales should be tested and validated with an independent sample to enhance the generalizability of the new scales; however, this step was not within the scope of this research and is identified as an area for future research. The remainder of this section discusses Steps 1 through 6, which will cover the all four steps of Hinkin (1998), i.e., item generation through content validity study.

3.10.1. Critical Success Factors Generation

Spector (1992) recommends that researchers should first clearly define the construct /framework/phenomenon based on theory, and then develop items that support the definition, and take a confirmatory approach to validate the theoretical ideas guiding the creation of items. In addition, when working with a complex construct, Spector (1992) also recommends that researchers should partition the construct into several key dimensions to ensure the adequacy of the content domain and develop a scale with multiple subscales by creating items for each separate dimension of the construct.

Hinkin (1998) proposes that creation of items to assess a phenomenon under examination can be conducted inductively whereby; the items are generated based on content analysis of the literature or experts or subjects' descriptions of the phenomenon. Scales (sets of survey items) can also be derived, or deductively elucidated whereby, a theoretical definition of a construct is developed based on an understanding of the relevant literature and of the phenomenon to be investigated.

The inductive approach is typically used when the researcher explores an unfamiliar phenomenon where little theory may exist, whereas the deductive approach is appropriate in situations where some theory exists (Hinkin, 1998).

This research adopted the inductive approach to develop construct definitions. Following the inductive approach, the initial review of Business Model Elements and their effect on Business Success/Performance and relevant literature was conducted to identify a conceptual framework and existing scales that defined or operationalized business models and their effect on Business Performance in order to guide the development of a theoretical definition of the Business Model construct.

To ensure that this process could produce an instrument strongly grounded in literature, a systematic literature review was conducted as detailed under Section 2.5, Chapter 2. To overcome this literature limitation, an initial pilot study with a focused sample of professionals from the life sciences BPO industry was undertaken (Study Sl. No. 1 -- under Table 3.2: Studies to identify existing Business Model Elements). A questionnaire consisting of theoretical business model elements essential for competitive advantage (and hence business performance) were identified by applying Porter's Five Forces Industry Analysis Framework (Porter, 2004), Six forces Analysis

(McAfee, Preston, 2005), Value Chain Analysis (Shank and Govindarajan, 1993) and Value Grid Analysis (Frits and Matthias, 2006). This questionnaire was administered to the identified sample population and based on their inputs an initial set of Business Model Elements were created. The business elements identified and their significant themes are presented in Annexure I under details of pilot studies.

Based on the results of this study, an adapted, high level, value grid for the Life Sciences BPO industry was created. This value grid depicts the various themes of the Life Sciences BPO industry and their relationships with each other. The vertical dimension of the value grid comprises the value adding components of the linear value chain and hence depicts the upstream and downstream processes. The horizontal dimension in the figure is represented by the variations or inherent factors under a specific value adding component to the value chain. End users of these services are depicted in the extreme right hand corner of the value grid.

After identifying the industry competitive forces and their influence on business performance, another pilot study was undertaken to determine business model elements essential and specific to make the Indian Life Sciences Business Process Outsourcing industry competitive (Study Sl. No. 2 – under Table 3.2 : Studies to identify existing Business Model Elements). In this study, an attempt was made to survey Life Sciences BPO professionals using a structured questionnaire methodology to arrive at the competitive nature of the Life Sciences BPO Industry and measure the global competitive nature of Indian Life Sciences BPO Industry. The questionnaire was created based on The World Economic Forum's 12 Pillars (themes) of Competitiveness (Xavier, 2008) based on : Institutions, Infrastructure, Macroeconomic stability, Health and primary education, Higher education and training, Goods market efficiency, Labor market efficiency, Financial market sophistication, Technological readiness, Market size, Business sophistication, Innovation to evaluate national competitiveness.

The business elements identified by this study are presented in Annexure I under details of pilot studies.

During these studies, and informal discussion of these results with experienced professionals in this industry, various elements which we could group under the theme Human Resources were found to be directly associated with business

performance. To identify these specific thematic elements and understand their relationships, another pilot study with a specific focus on the Human Relations theme was undertaken (Study Sl. No. 3 – under Table 3.2: Studies to identify existing Business Model Elements).

A 25 item, structured questionnaire was developed based on information collected after extensive desk study followed by review of publications, from various industry reports and through informal interviews with HR professionals. Although this list was not very exhaustive, these were the most commonly referred to challenges in the BPO context. An option was provided in the questionnaire for the respondent/s to indicate additional elements not covered under those provided. Respondents were randomly selected from top and middle level HRM professionals from the organizational hierarchy of BPO's located in various Indian cities. On analysis of the data collected, elements and significant themes presented in Annexure I under details of pilot study were identified along with an understanding of their relationship/s.

To identify more business model elements and hence make the final survey instrument stronger, a final pilot study (Study Sl. No. 4 – under Table 3.2: Studies to identify existing Business Model Elements) was undertaken with a different and much more intense thematic focus. This study used the methodology of Critical Success Factor Analysis to identify business model elements and their relationships. The concept of identifying and applying CSFs to business problems dates back to the original concept of "success factors" put forth in management literature by D. Ronald Daniel in the 1960s. However, the CSF concepts and approach are still very powerful today and are applicable to many of the business challenges being presented. The CSF method has found its way into many formalized information or business systems and technology planning methodologies that are still being used today (Richard, 2004).

An effort was made to survey Life Sciences BPO professionals using the structured questionnaire methodology to arrive at a strategic framework for creating a life sciences specific BPO business model and also measure the essentiality of these identified critical success factors from the Life Sciences BPO Industry and Business context. This would ultimately identify business model elements, relationship between these elements and the initial response on how essential the respondents consider these elements to business performance.

On analysis of the data collected, elements and significant themes presented in Annexure I under details of pilot study were identified along with an understanding of their relationship/s.

Taken together, findings of all the above indicated pilot studies yielded support for creation and the validity of the proposed framework for identifying, assessing and evaluating business model elements and their essentiality on business performance in the Life Sciences BPO industry domain.

3.10.2. Identification of Most Important "Critical Success Factors" (Elements) and "Source of Critical Success Factors" (Themes)

Based on the results of the above study and iterative process of identifying and grouping similar items which utilized judgment by the researcher a total of eight (8) Source of CSF's (significant themes) and fifty two (52) CSF's (business model elements) were identified. These identified CSF's were used to guide the generation of the final survey items representing the concept of business models in the Indian Life Sciences BPO industry.

During the identification and grouping process, all 121 items were reclassified into 8 themes based on operational definitions for the themes. For example, identified items like Physical Infrastructure were categorized under under Strategy. Within each Source of CSF, the categorized elements were further grouped into a subtheme of similar ideas. The process was an iterative one. While grouping the similar items into subthemes, the count of the number of items assigned to each theme was recorded. In order to ensure that the themes and their embedded elements were distinct constructs, any elements or themes that related to other variables were screened out. Similar elements using different wordings in different questionnaire were merged into one element. For the purpose of parsimony, any themes with only one item assigned to it were marked as candidate for deletion and some were deleted based on judgment of the researcher.

In the end, 52 CSF's (elements) under 8 Source of CSF's (themes) were identified. At least five CSF's were identified for each of the 8 Source of CSF's. These themes served as the major source of input for developing the final survey items.

3.10.3. Critical Success Factors Development

According to Hinkin (1998), several basic guidelines should be followed in developing scales (i.e., a set of items to measure a construct). First, all items should focus on the same perspective, i.e., items representing behaviors should not be included in the same scale as items represented outcomes of behaviors. Second, "double-barreled" items should be avoided and an item should focus on only a single idea. Third, statements should be concise and simple using language that target respondents are familiar with and understand. Forth, items with negatively-worded or reverse-scored items should be used with caution. Hinkin et al. (1997) add that items that may introduce biased responses, i.e., leading to questions, should also be avoided.

Spector (1992) recommends that items should be written in plain English and avoid using jargon, colloquialisms and expression, and the reading level of respondents should be taken into consideration. Ideally, several statements that have slightly different shades of meaning should be generated for each item and the best statement representing the item should then be selected (Lewis et al., 2005).

Following these guidelines, scale items (elements/CSF's) were written to reflect each of the 8 themes (Source of CSF's). Because of the large number of items, a single statement, however, was written for each item. Still, the wording of each statement was reviewed multiple times by the researcher and the researcher's advisor. Through this process, alternative statements were created for items that were unclear and the best statement was selected for those items.

Table 3.3 under Annexure I below provides the item statements together with the respective themes. Next, these items were subject to a content validity study.

3.11. Content Validity Assessment and Reliability Analysis

A pilot study was undertaken to assess content validity and reliability of the CSF's (elements) and Source of CSF's identified and developed as exhibited under "Exhibit 1: Developed Critical Success Factors and Source of CSF's" enclosed under Annexure I. Rungtusanatham (1998), defines content validity as "the degree to which the measurement instrument spans the domain of the construct's theoretical definition; it is the extent to which a measurement instrument captures the different facets of a

construct". The content validity assessment should be conducted once items are generated (Hinkin, 1998).

According to Hinkin (1998) there is no one best technique for assessing content validity and no technique can ensure that content validity is obtained. The available approaches can only provide "content adequacy" for the new instrument. Polit and Beck (2006), also write that assessment of content validity is a posteriori exercise of judgment used by a researcher to evaluate the content relevance of a measurement instrument after careful conceptualization and domain analysis during item generation. Tojib and Sugianto (2006) observe that there are both qualitative methods (Delphi or Q-sort) and quantitative methods (Content Validity Ratio, Content Validity Index, etc.).

This research assessed content validity of the instrument using a modified version of Tojib and Sugianto's (2006) Content Validity Index (CVI) because this assessment can be performed relatively quickly and easily while offering criteria to retain or delete items from an instrument. Reliability analysis (Nunnally, 1978) of the responses was also performed. The reliability of the survey scales was evaluated by computing Cronbach's alpha for each element (CSF) (Cronbach, 1951). Thus, a content validity and reliability study, was conducted using a survey questionnaire consisting CSF's and Source of CSF's presented under "Exhibit 1: Developed Critical Success Factors and Source of CSF's" enclosed under Annexure I.

3.11.1. Content Validity Assessment Reliability Analysis Procedure

Content validity in the current study was assessed through one round of content validation and also by applying the technique of reliability analysis using a panel of content experts (Nunnally, 1978). The criteria for selecting the content experts were derived from the guidelines proposed by Grant et al, (1992) that is, 1) they must hold a PhD qualification or be PhD candidates and 2) they should actively conduct research in the domain of interest or have professional experience in the indicated domain.

Fifteen industry experts, four academics and six doctorate students from Indian universities were initially identified as prospective content experts, on the basis of their publications as well as their professional LinkedIn profiles. Personalized email

invitations were sent to the identified samples, outlining the reasons why they were selected, the purpose of the study, and a request for their participation in the study. Positive responses were received from seven industry experts, two academics, three PhD candidates. Specific, structured instructions for these reviewers were then emailed to each of them, outlining in detail the tasks that have to be completed. They were asked to complete the tasks attached with the instruction document using Microsoft Word. The completed document was emailed back to the researcher. Within one month, twelve responses were received from the content experts. Two responses were excluded because of incomplete response and loss to follow-up. Finally, only ten responses could be included for further analysis.

The experts were asked to complete the questionnaire with two components. The first component of the questionnaire contained an option for the expert to indicate the essentiality of individual element under a specific theme. In the second option they were asked to rate the importance of each dimension using a 5-point rating scale (1 represents 'Least Important', 5 represents 'Most Important'). These were important to identify the agreement of experts on the correctness of the identified elements and its expected dimension. Finally, the content experts were also asked to provide comments on the completeness of dimensions and the appropriateness of the items.

3.11.2. Discussion of Results and Findings from Content Validity Study and Reliability Analysis

94% of the experts confirmed the essentiality of the elements and their placement under a specific theme. The mean responses given by experts to the measure of essentiality were calculated for each dimension. All mean values of the importance rating given for each dimension were greater than 3, ranging from 3.92 to 4.76. This finding suggested that all dimensions were confirmed to be essential.

The above collected data was also used to analyze the elements and its theme for reliability (reliability analysis) using the method suggested by Nunnaly (1978). Hatcher (1994) indicates that since Cronbach's alpha is a coefficient of reliability (or consistency) and determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability, coefficient ranges in value from 0 to 1 may be used to describe the reliability of factors extracted from dichotomous (that is, questions with two possible answers) and/or multi-point formatted questionnaires or

scales (i.e., rating scale: 1 = poor, 5 = excellent). Nunnaly (1978) indicates that a Cronbach's alpha of 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature.

Using this method of reliability analysis, removal of element numbers 13, 17, 19, 46, 47, 52 would help the survey instrument attain reliability of more than 0.7 (0.729). Due to this, the specified elements were excluded from the Questionnaire exposed to Content Validity and Reliability analysis to arrive at the final survey instrument presented in "Exhibit 2 : Final Instrument – Critical Success Factors and Source of CSF's" enclosed under Annexure I.

The final survey instrument consists of eight (8) Source of CSF's (significant themes) namely : Strategy, Human Resources, Operations, Marketing, Finance, Environment, Industry and Innovation. Under these Source of CSF's, a total of forty six (46) Critical Success Factors (business model elements) are included. Source of CSF – Strategy includes 8 CSF's, Human Resources includes 5 CSF's, Operations 3 CSF's, Marketing 7 CSF's, Finance 7 CSF's, Environment 6 CSF's, Industry 6 CSF's and Innovation 4 CSF's. Details of the analysis are provided under Annexure II.

Chapter 4

Data Analysis and Discussion

The organization of this chapter is as follows. First, the overview of the methods to analyze the proposition and research hypotheses is discussed. Next, results of qualitative analysis of the business elements and their relationships are discussed, followed by a discussion on creation of a generalized business model through quantitative analysis of the survey data. This is followed by discussion of the analysis of hypothesis related to effects of business models on business performance. Finally, the chapter concludes by discussing the comparative study of Indian Life Sciences BPO organizations using the created generalized business models specific to Life Sciences BPO industry.

4.1. Overview of Statistical Methods

This study has utilized the techniques of descriptive statistics, validity testing, reliability testing, exploratory factor analysis, regression analysis and tests for hypothesis. Microsoft Excel 2007 was used for initial data collection and data cleaning. Statistical software program SPSS17.0 for Windows was employed to analyze the data collected in this study. As indicated previously, analysis was performed on 243 usable respondents' data out of the received 347 responses from 2857 participation invites sent to potential respondents. This data was used to identify and thematize elemental CSF's into themes and reduce them to arrive at a more manageable four factor solution using Exploratory Factor Analysis.

Business performance metric RTS was then calculated for 46 Life Sciences BPO organizations and multiple regression analysis procedure was used to construct the generic business model framework.

Based on comparative study respondent scoring, and applying the generic business model framework, various, existing business models were identified, compared and ranked accordingly. Spearman's rank correlation procedure was used to finally test the association between predicted RTS value(from the model) and factual RTS values of organizations which would also test robustness of the proposed generic business model framework.

4.1.1. Profile of Respondents

Out of 46,376 members belonging to various outsourcing specific LinkedIn groups and researcher's networks, 2857(6.16%) potential respondents were identified. Solicitation to participate in this survey was sent to these potential respondents. Out of these potential respondents, a total of 347 (12.15%) took the online survey. Only 243 (70.03%) of these received responses were categorized as usable surveys and considered for further analysis. Incomplete surveys which participants did not complete even after 3 reminder e-mails, were categorized as non-usable and not included for further analysis.

Details of the sampling frames, the geographic distribution of the respondents and other demographic details are provided in Tables 4.1 to 4.7 given below and Figures 4.5 to 4.10 given under Annexure VI.

Table 4.1- Respondents geographic profile

Sl.	Geography	Frequency	Percent	Valid Percent	Cum. Percent
1.	India	61	25.1	25.1	25.1
2.	United States of America (USA)	107	44.0	44.0	69.1
3.	European Union (EU)	61	25.1	25.1	94.2
4.	Others	14	5.8	5.8	100.0
	TOTAL	243	100.0	100.0	

From the table above it can be observed that around 25% of the sample respondents were from India and the European Union compared to around 44% who were from the United States. Only 5.8% of the respondents were from other countries.

Table 4.2- Respondents business profile

Sl.	Business Profile	Frequency	Percent	Valid Percent	Cum. Percent
1.	Customer	158	65.0	65.0	65.0
2.	Service Provider	85	35.0	35.0	100.0
	TOTAL	243	100.0	100.0	

65% of the respondents were customers (characterized as respondents who require Outsourced services) whereas the remaining 35% were service providers (characterized as respondents who provide Outsourced services to customers) (Table 4.2; Figure 4.2).

Table 4.3- Respondents business activity profile

Sl.	Business Activities	Frequency	Percent	Valid Percent	Cum. Percent
1.	Service_BPO	17	7.0	7.0	7.0
2.	Service_CRO	68	28.0	28.0	35.0
3.	Customer_BPO	59	24.3	24.3	59.3
4.	Customer_CRO	99	40.7	40.7	100.0
	TOTAL	243	100.0	100.0	

Out of the 243 respondents, 7% constituted BPO Service Providers (Service providers providing BPO services), 28% CRO (Clinical Research Organization) Service providers (Service providers providing CRO services), 24.3% BPO Customers (characterized as respondents who require BPO Outsourced services) and 40.70% of CRO Customers (characterized as respondents who require CRO Outsourced services).

Table 4.4- Respondents profile based on Geography and Business Activity

Sl.	Business Activities	India	USA	EU	Others	Total
1.	Service_BPO	1	10	5	1	17
2.	Service_CRO	52	10	5	1	68
3.	Customer_BPO	2	34	20	3	59
4.	Customer_CRO	6	53	31	9	99
	TOTAL	61	107	61	14	243

A total of 61, all inclusive business activity respondents (Service_BPO, Service_CRO, Customer_BPO, Customer_CRO) came from India when compared to 107 from the USA, 61 from EU and 14 from other countries.

Table 4.5- Respondents organization hierarchy profile

Sl.	Organization Hierarchy	Frequency	Percent	Valid Percent	Cum. Percent
1.	Senior Management	65	26.7	26.7	26.7
2.	Director	60	24.7	24.7	51.4
3.	Manager	54	22.2	22.2	73.7
4.	Vice President	35	14.4	14.4	88.1
5.	Chief Functional Officer	29	11.9	11.9	100.0
	TOTAL	243	100.0	100.0	

26.7% of the total respondents were Senior management (characterized as respondents holding a position in the top two tiers of the organization), 24.70% were directors (characterized as respondents holding a services functional head position in the organization), 22.20% were managers (characterized as respondents holding an operations functional head position in the organization), 14.40% were Vice Presidents (characterized as respondents holding a business functional head position in the organization), and around 12% were Chief functional officers (characterized as respondents holding both business and functional head position in the organization).

Table 4.6- Respondents organization roles profile

Sl.	Organization Roles	Frequency	Percent	Valid Percent	Cum. Percent
1.	Business Development (BD)	46	18.9	18.9	18.9
2.	Research & Development (R&D)	49	20.2	20.2	39.1
3.	Operations (Ops)	39	16.0	16.0	55.1
4.	Sales	29	11.9	11.9	67.1
5.	Consulting	51	21.0	21.0	88.1
6.	Program Management (PMO)	29	11.9	11.9	100.0
	TOTAL	243	100.0	100.0	

Organization roles of a majority of respondents, Business development and Sales categories, put together were around 30% followed by the Consultant category of 21% compared to 20.20% in Research & Development, and 16.0% in Operations.

Table 4.7- Respondents Industry profile

Sl.	Industry	Frequency	Percent	Valid Percent	Cum. Percent
1.	Pharmaceuticals (PH)	107	44.0	44.0	44.0
2.	Biotechnology (BT)	58	23.9	23.9	67.9
3.	Drug Development (DD)	12	4.9	4.9	72.8
4.	Information Technology (IT)	29	11.9	11.9	84.8
5.	Staffing & Recruitment (HR)	21	8.6	8.6	93.4
6.	Management Consulting (MC)	16	6.6	6.6	100.0
	TOTAL	243	100.0	100.0	

A majority of the respondents belonged to the Pharmaceutical 44.0% and Biotechnology industry 23.90%. The service providers in these categories provided services specifically to one or more industry segments indicated in the table.

A large percent of the respondents were males 82.70% and a majority of the respondents had postgraduate qualifications (characterized as respondents who have completed their graduate certification and hold a diploma certification or more in a specialized functional area), 67.50%.

4.2. Elemental Critical Success Factors

In this part of the study, identification of elemental critical success factors, categorization under specific themes, their relationships and exploratory factor analysis to arrive at a more manageable factor solution is explained.

4.2.1. Exploratory Data Analysis

Adams et al., (2007) state that the objective of Qualitative Analysis is to reduce an overwhelming amount of data gathered. They also state the aims of qualitative data are the following :

1) Exploration phase
    a. To detect patterns in data
    b. Identify deviants and oddities
2) Classification Stage
    a. To Compare to Theory / Detection of conformance
    b. Identify Groups
3) Drawing Conclusion Phase
    a. To Compare to Theory / Detection of conformance
    b. Compare and Contrast Groups
4) Representation Phase
    a. Construct a Model
5) Testing Phase
    a. Test the model – Validation.

Phases/Steps 1 and 2 outlined above have already been completed through pilot studies (for identification of elements affecting business performance in Life Sciences

BPO Industry) as explained in Chapter 3. One of the objectives of this stage in research being the identification of element and categorization of these identified elements into themes (Critical Success Factor's). This objective was attained by applying Critical Success Factor Analysis to the identified elements which affect business performance.

Under this heading, application of phases/steps 3 and 4 to data collected from the survey instruments is explained along with the results. Phase 5 was not implemented at this stage, since application of quantitative statistical techniques would help in creating a more rugged model which can be applied to compare the effect of business models on Business performance of Indian Life Sciences BPO industry.

Methodology used in the survey, to identify critical success factors that affect business performance were based on a 5-point scale with preset response possibilities. Since all identified and categorized elements were identified through pilot studies, it was assumed that all the identified elements are essential for business success in the Life Sciences BPO domain. Hence, answers were rated by level of agreement of the identified and categorized elements affecting business performance, including least important (Point=1), to most important (Point=5) for business performance. The respondents also had an option to categorize/identify the indicated elements not essential for business performance in the Life Sciences BPO industry. The distribution of these scores for the identified and categorized 46 Critical Success Factors are given under Table 4.8.

Table 4.8- Distribution of Importance and Effect on Business Success

Sl.	Critical Success Factors (CSF)		DEGREE OF IMPORTANCE OF CRITICAL SUCCESS FACTORS						TOTAL
			Not Applicable	Least Important (1 Point)	Important (2 Points)	Neutral (3 Points)	Very Important (4 Points)	Most Important (5 Points)	AGREE ON ESSENTIALITY FOR BUSINESS SUCCESS
	STRATEGIC CSF's								
1	Physical Infrastructure	n	5	0	79	29	85	45	238.00
		%	2.06	0.00	32.51	11.93	34.98	18.52	97.94
2	Technology	n	0	0	34	29	78	102	243.00
		%	0.00	0.00	13.99	11.93	32.10	41.98	100.00
3	Support Services	n	0	5	22	29	107	80	243.00
		%	0.00	2.06	9.05	11.93	44.03	32.92	100.00
4	Management Commitment	n	0	0	5	5	119	114	243.00
		%	0.00	0.00	2.06	2.06	48.97	46.91	100.00
5	Organizational Effectiveness	n	0	0	22	39	73	109	243.00
		%	0.00	0.00	9.05	16.05	30.04	44.86	100.00

Sl.	Critical Success Factors (CSF)		DEGREE OF IMPORTANCE OF CRITICAL SUCCESS FACTORS						TOTAL
			Not Applicable	Least Important (1 Point)	Important (2 Points)	Neutral (3 Points)	Very Important (4 Points)	Most Important (5 Points)	AGREE ON ESSENTIALITY FOR BUSINESS SUCCESS
6	Business flexibility	n	5	5	30	36	94	73	238.00
		%	2.06	2.06	12.35	14.81	38.68	30.04	97.94
7	Partners / Collaborators	n	0	0	54	59	76	54	243.00
		%	0.00	0.00	22.22	24.28	31.28	22.22	100.00
8	Corporate ethics	n	0	5	19	6	105	108	243.00
		%	0.00	2.06	7.82	2.47	43.21	44.44	100.00
	HUMAN RESOURCES CSF's								
9	Availability	n	0	0	50	22	132	39	243.00
		%	0.00	0.00	20.58	9.05	54.32	16.05	100.00
10	Employability	n	0	0	38	21	139	45	243.00
		%	0.00	0.00	15.64	8.64	57.20	18.52	100.00
11	Skills & Attitude	n	0	5	17	6	79	136	243.00
		%	0.00	2.06	7.00	2.47	32.51	55.97	100.00
12	Domain Knowledge	n	0	0	25	25	83	110	243.00
		%	0.00	0.00	10.29	10.29	34.16	45.27	100.00
13	HR practices	n	0	0	68	64	58	53	243.00
		%	0.00	0.00	27.98	26.34	23.87	21.81	100.00
	OPERATIONS CSF's								
14	Process Management	n	0	0	62	5	86	90	243.00
		%	0.00	0.00	25.51	2.06	35.39	37.04	100.00
15	Quality Systems	n	0	5	27	1	88	122	243.00
		%	0.00	2.06	11.11	0.41	36.21	50.21	100.00
16	Global Delivery Footprint	n	0	6	6	25	94	112	243.00
		%	0.00	2.47	2.47	10.29	38.68	46.09	100.00
	MARKETING CSF's								
17	Depth of Services	n	0	6	40	42	104	51	243.00
		%	0.00	2.47	16.46	17.28	42.80	20.99	100.00
18	Unique Positioning	n	6	0	25	41	90	81	237.00
		%	2.47	0.00	10.29	16.87	37.04	33.33	97.53
19	Business Flexibility	n	6	6	40	25	109	57	237.00
		%	2.47	2.46	16.46	10.29	44.86	23.46	97.53
20	Customer Relationships	n	0	6	22	14	83	118	243.00
		%	0.00	2.47	9.05	5.76	34.16	48.56	100.00
21	Sales Force Size	n	7	0	68	44	97	27	236.00
		%	2.88	0.00	27.98	18.11	39.92	11.11	97.12
22	Sales Force geo presence	n	6	12	53	56	95	21	237.00
		%	2.47	4.94	21.81	23.05	39.09	8.64	97.53
23	Customer Satisfaction	n	6	0	26	9	116	86	237.00
		%	2.47	0.00	10.70	3.70	47.74	35.39	97.53
	FINANCE CSF's								
24	Investment	n	0	0	48	19	116	60	243.00
		%	0.00	0.00	19.75	7.82	47.74	24.69	100.00
25	Access to Capital markets	n	6	0	53	41	111	32	237.00
		%	2.47	0.00	21.81	16.87	45.68	13.17	97.53
26	Cost Structure	n	0	0	29	30	115	69	243.00
		%	0.00	0.00	11.93	12.35	47.33	28.40	100.00
27	Revenue Stream	n	0	7	18	19	143	56	243.00
		%	0.00	2.88	7.41	7.82	58.85	23.05	100.00
28	Cash Flow Management	n	0	6	29	12	107	89	243.00
		%	0.00	2.47	11.93	4.94	44.03	36.63	100.00
29	Sustenance	n	7	2	12	15	149	58	236.00
		%	2.88	0.82	4.94	6.17	61.32	23.87	97.12

Sl.	Critical Success Factors (CSF)		DEGREE OF IMPORTANCE OF CRITICAL SUCCESS FACTORS						TOTAL
			Not Applicable	Least Important (1 Point)	Important (2 Points)	Neutral (3 Points)	Very Important (4 Points)	Most Important (5 Points)	AGREE ON ESSENTIALITY FOR BUSINESS SUCCESS
30	Customer focus	n	0	6	15	13	100	109	243.00
		%	0.00	2.47	6.17	5.35	41.15	44.86	100.00
	ENVIRONMENT CSF's								
31	Political	n	0	30	9	76	103	25	243.00
		%	0.00	12.35	3.70	31.28	42.39	10.29	100.00
32	Economic (Internal to org)	n	0	7	43	25	127	41	243.00
		%	0.00	2.88	17.70	10.29	52.26	16.87	100.00
33	Socio cultural	n	0	7	56	78	79	23	243.00
		%	0.00	2.88	23.05	32.10	32.51	9.47	100.00
34	Technological	n	0	0	24	31	97	91	243.00
		%	0.00	0.00	9.88	12.76	39.92	37.45	100.00
35	Global business cycle	n	1	6	38	56	70	72	242.00
		%	0.412	2.47	15.64	23.05	28.81	29.63	99.59
36	Regulatory	n	0	1	16	12	136	78	243.00
		%	0.00	0.41	6.58	4.94	55.97	32.10	100.00
	INDUSTRY CSF's								
37	Threat of Substitute Products / Services	n	12	0	40	48	81	62	231.00
		%	4.94	0.00	16.46	19.75	33.33	25.51	95.06
38	Threat of New Entrants	n	1	12	53	72	70	35	242.00
		%	0.412	4.94	21.81	29.63	28.81	14.40	99.59
39	Competitive Rivalry Within Industry	n	6	0	62	34	91	50	237.00
		%	2.47	0.00	25.51	13.99	37.45	20.58	97.53
40	Bargaining Power of Buyers	n	13	0	20	28	115	67	230.00
		%	5.35	0.00	8.23	11.52	47.33	27.57	94.65
41	Bargaining Power of Suppliers	n	7	6	26	67	84	53	236.00
		%	2.88	2.47	10.70	27.57	34.57	21.81	97.12
42	Bargaining Power of Complementors	n	6	0	43	42	108	44	237.00
		%	2.47	0.00	17.70	17.28	44.44	18.11	97.53
	INNOVATION CSF's								
43	Service Innovation	n	0	0	24	13	106	100	243.00
		%	0.00	0.00	9.88	5.35	43.62	41.15	100.00
44	Operational Innovation	n	0	7	18	19	98	101	243.00
		%	0.00	2.88	7.41	7.82	40.33	41.56	100.00
45	Marketing Innovation	n	0	6	50	19	98	70	243.00
		%	0.00	2.47	20.58	7.82	40.33	28.81	100.00
46	Technological Innovation	n	0	0	18	26	88	111	243.00
		%	0.00	0.00	7.41	10.70	36.21	45.68	100.00

The weighted average for each element under Critical Success Factor Themes were arrived at to understand the importance of each elemental critical success factor under a specific CSF theme (eg : Elemental CSF "Physical Infrastructure" under the theme

"Strategic CSF's") and their relationships if any. The following Tables (4.9 to 4.17) given below and Figures (4.12 to 4.19) given under Annexure VI helps us understand and visualize the degree of importance of each critical success factor and the essentiality of each element for business success under each CSF theme.

Table 4.9- Strategic CSF – Total and average ranking by degree of importance

Sl.	Strategic CSF	Total	Weighted Average
1	Management Commitment	1071	4.41
2	Corporate ethics	1021	4.20
3	Organizational Effectiveness	998	4.11
4	Technology	977	4.02
5	Support Services / Systems	964	3.97
6	Business flexibility	914	3.76
7	Partners / Collaborators / Enablers	859	3.53
8	Physical Infrastructure	810	3.33

A weighted total of 1071 contributes towards identifying the elemental CSF "Management Commitment" as the most important elemental CSF in this theme. The next most important elemental CSF is "Corporate Ethics". This is also in agreement with the common consensus that the probability of business failure increases to a very large extent when there is no Management Commitment and Corporate Ethics.

Table 4.10- HR CSF–Total and average ranking by degree of importance

Sl.	Human Resources CSF	Total	Weighted Average
1	Skills & Attitude	1053	4.33
2	Domain Knowledge	1007	4.14
3	Employability	920	3.79
4	Availability	889	3.66
5	HR practices	825	3.40

The elemental CSF "Skills and Attitude" was identified as the most important elemental CSF in the Human Resources theme. This elemental CSF refers to existing skills of existing/available human resources and their attitude towards the organization, their job and their career. "Domain Knowledge" came as the second most important factor which affects business success in this category.

Table 4.11-Operations CSF–Total and average ranking by degree of importance

Sl.	Operations CSF	Total	Weighted Average
1	Global Delivery Footprint	1029	4.23
2	Quality Systems	1024	4.21
3	Process Management	933	3.84

Unlike other industries, Global Delivery Footprint including Operational Flexibility, and Customer Focused Delivery have been identified as the most important elemental CSF for business success in this industry domain. Although one of the main criteria for outsourcing is cost arbitrage, attaining this critical milestone and providing services from various geographies by utilizing that specific geography's competencies is a very critical factor for business success.

Table 4.12-Marketing CSF – Total and average ranking by degree of importance

Sl.	Marketing CSF	Total	Weighted Average
1	Customer Relationships & Management	1014	4.17
2	Customer Satisfaction Feedback	973	4.00
3	Unique Positioning Advantage	938	3.86
4	Depth of Services	883	3.63
5	Business Flexibility	882	3.63
6	Sales Force Size & Productivity	791	3.26
7	Sales Force Geographic presence	771	3.17

A weighted total of 1014 contributes towards identifying the elemental CSF "Customer Relationship and Management" as the most important elemental CSF in this theme. The next most important elemental CSF is "Customer Satisfaction Feedback". This is also in agreement with the common consensus that a customer focus especially in the services industry is critical for business success.

Table 4.13-Finance CSF – Total and average ranking by degree of importance

Sl.	Finance CSF	Total	Weighted Average
1	Customer focused Practices	1020	4.20
2	Cash Flow Management	973	4.00
3	Sustenance	957	3.94
4	Cost Structure	953	3.92
5	Revenue Stream	952	3.92
6	Investment	917	3.77
7	Access to Capital markets	833	3.43

A weighted total of 1020 contributes towards identifying the elemental CSF "Customer Focused Practices" (like pricing flexibility, adaptable project financial management, geography specific pricing etc.,) as the most important elemental CSF in this theme. The next most important elemental CSF is "Cash Flow Management". This is also in agreement with the common consensus that for the business to succeed, organizations need to enforce adaptive pricing practices to win business but at the same time ensure optimal cash flows for organization survival and growth.

Table 4.14- Environment CSF–Total, average ranking by degree of importance

Sl.	Environment CSF	Total	Weighted Average
1	Regulatory	1003	4.13
2	Technological	984	4.05
3	Global business cycle	890	3.66
4	Economic (Internal to the organization)	881	3.63
5	Political	813	3.35
6	Socio cultural	784	3.23

Since Life Sciences industry is highly regulated, its but natural that a weighted total of 1003 contributes towards identifying the elemental CSF "Regulatory" as the most important elemental CSF in this theme. The next most important elemental CSF is "Technological" since technological intervention enhance productivity along with an increase in expected process quality.

One surprise though is that most of the respondents through their scoring do not think the elemental CSF "Political" leading to visa restrictions, policy lead resistance to outsourcing, policy lead economic recession etc., has a big effect on business success.

Table 4.15- Industry CSF – Total and average ranking by degree of importance

Sl.	Industry CSF	Total	Weighted Average
1	Bargaining Power of Buyers	919	3.78
2	Bargaining Power of Complementors	864	3.56
3	Bargaining Power of Suppliers	860	3.54
4	Threat of Substitute Products / Services	858	3.53
5	Competitive Rivalry Within Industry	840	3.46
6	Threat of New Entrants	789	3.25

A weighted total of 919 contributes towards identifying the elemental CSF "Bargaining Power of Buyers" as the most important elemental CSF in this theme. The next most important elemental CSF is "Bargaining Power of Complementors". The respondents do agree that the threat of new entrants into this industry does not really affect business success.

Table 4.16-Innovation CSF–Total and average ranking by degree of importance

Sl.	Innovation CSF	Total	Weighted Average
1	Technological Innovation	1021	4.20
2	Service Innovation	1011	4.16
3	Operational Innovation	997	4.10
4	Marketing Innovation	905	3.72

A weighted total of 1021 contributes towards identifying the elemental CSF "Technological Innovation" as the most important elemental CSF in this theme. The next most important elemental CSF is "Service Innovation". This provides an insight into saying that this industry is a technology driven service industry.

Table 4.17-Average of CSF themes ranked by degree of importance

SL.	Critical Success Factors	Weighted Average
1	OPERATIONS	4.10
2	INNOVATION	4.05
3	STRATEGY	3.92
4	FINANCE	3.88
5	HUMAN RESOURCES	3.86
6	MARKETING	3.68
7	ENVIRONMENT	3.67
8	INDUSTRY	3.52

On summarizing the weighted average of all theme critical success factors, Operations with a weighted average of 4.10 stands out as the most important CSF theme essential for business success. Next comes Innovation with a weighted average of 4.05 followed by Strategy with a weighted average of 3.92. The effect of industry related elemental CSF's have the least effect on business success.

In conclusion, elemental success factors under the CSF Theme Operation and Innovation (GROUP 1) influence business success of Life Sciences BPO industry to a

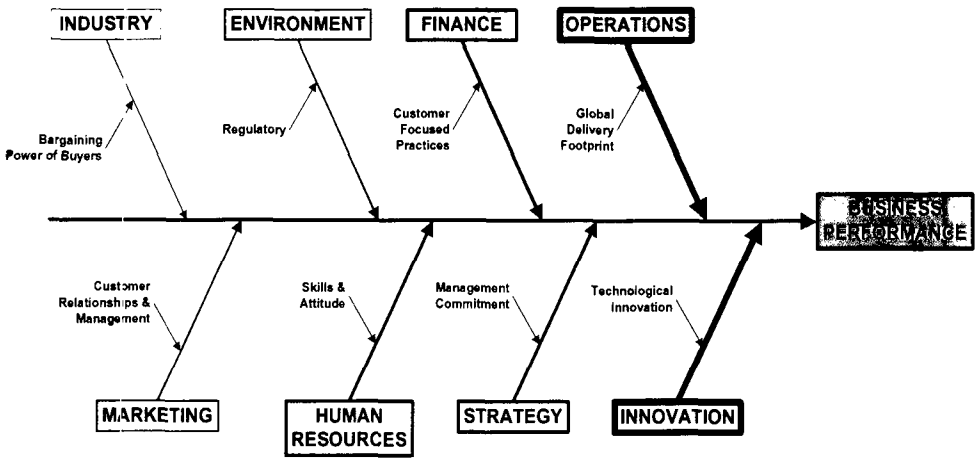
maximum extent respectively. Strategy, Human resources and Finance CSF themes (GROUP 2) in that order, are the next group of theme CSF's which influence business success in this industry to a large extent when compared to CSF themes Operation and Innovation.

Marketing and Environment theme CSF's (GROUP 3) form the third group of theme CSF's which affect business success in this industry. In terms of their quantitative influence, they lag behind Strategy, Human resources, Finance CSF themes and Operation, Innovation themes.

The Industry CSF (GROUP 4) theme is quantitatively the least influencing theme on business success when compared to Marketing, Environment theme CSF's, Strategy, Human resources, Finance CSF and Operation, Innovation themes. Figure 4.20 given under Annexure VI helps us visualize the grouping of theme CSF's based on their weighted averages.

In summary, we can conclude that the 46 elemental CSF's can be grouped into 8 Theme CSF's and based on qualitative analysis we can further categorize them into four groups based on their quantitative influence on business success of the Life Sciences BPO industry. The quantitative influence of each theme CSF is arrived at by considering their weighted average. Based on this we can create a qualitative or exploratory model which depicts the effect of CSF's on business success, through a cause and effect diagram (Figure 4.1) which would help visualize the critical success factor themes, the most important elemental CSF's under a specific theme, their relationships and their weightages in affecting business success in the Life Sciences BPO Industry.

Figure 4.1- Exploratory Generic Business Model Framework



4.2.2. Factor Reduction

The next step in data analysis was to discover simple patterns in the pattern of relationships among the Critical Success Factor variables and in particular, seek to discover if the observed variables can be explained largely or entirely in terms of a much smaller number of variables. According to Kline (1994), Factor analysis consists of a number of statistical techniques the aim of which is to simplify complex sets of data and in social sciences factor analysis is usually applied to correlations between variables.

In other words, the next step was to understand the correlation of the collected data, reduction of this set of observed data to a smaller set of variables and verification of unidimensionality of the scale or subscale. This can be attained by Exploratory Factor Analysis (EFA) (Conway and Huffcutt, 2003). According to Costello (2005), EFA is a widely utilized and broadly applied statistical technique in the social sciences and in recently published studies, EFA was used for a variety of applications.

A survey by Costello (2005) in PsycINFO yielded over 1700 studies, that used some form of EFA. Well over half listed principal components analysis as the preferred factor extraction method, with varimax rotation as the method used for data analysis, and of those researchers who report their criteria for deciding the number of factors to be retained for rotation, a majority use the Kaiser criterion (all factors with eigen values greater than one).

Costello (2005) also proposes that the best choice/method for researchers to use to decide on how many factors to retain for rotation is the scree test. The scree test involves examining the graph of the eigen values and looking for the natural bend or break point in the data where the curve flattens out. The number of datapoints above the "break" (i.e., not including the point at which the break occurs) is usually the number of factors to retain.

According to Fabrigar et al., (1999); MacCallum, et al., (1999), adequate sample size is partly determined by the nature of the data. In general, the stronger the data, the smaller the sample can be for an accurate analysis. "Strong data" in factor analysis means uniformly high communalities without cross loadings, plus several variables loading strongly on each factor. In practice these conditions can be rare (Mulaik, 1990; Widaman, 1993). MacCallum et al. (1999) assert that the rules of thumb

regarding sample size in factor analysis (cases-to-item ration of 10:1) should not be trusted and the minimum sample size should take into account the level of communality, i.e., the portion of the variance of an item that is accounted for by the common factor. For exploratory factor analysis, they found that with small sample size of 100, the mean level of communality should be at least 0.7 with 3-7 strongly loaded items per factors, and when the mean of level of communality is about 0.5, a larger sample of 100 to 200 is required (MacCallum et al., 1999).

Also, when Costello (2005) surveyed two years' worth of PsychINFO articles that both reported some form of principal components or exploratory factor analysis and listed both the number of subjects and the number of items analyzed, a cumulative percent of 63.2% studies reported factor analyses based on subject to item ratios of > 5:1, to 10:1.

To maintain adequate power for EFA in this study, in the analysis of critical success factors, a total of 46 items were subjected to exploratory factor analysis. Stevens (1986) recommended a cases-to-variables ratio of 5:1 to guarantee a reliable factor analysis procedure; however, some researchers such as Fuller and Swanson (1992) have worked with ratios as low as 2:1. There were a total of 243 cases/subjects for the 46 critical success factors / items, thus, resulting in a cases-to-variables ratio of 5.30:1, which slightly exceeds the suggested ratio limits.

Table 4.18-Total variance of critical success factors analyzed

Total Variance Explained

Component[#]	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	35.069	76.236	76.236	35.069	76.236	76.236	21.835	47.468	47.468
2	6.931	15.068	91.305	6.931	15.068	91.305	14.641	31.827	79.295
3	2.286	4.970	96.274	2.286	4.970	96.274	7.471	16.242	95.537
4	1.714	3.726	100.000	1.714	3.726	100.000	2.053	4.463	100.000

Extraction Method: Principal Component Analysis

Principal component analysis (PCA) was used for factor extraction to obtain estimates of the initial factors that account for the largest variance in the sample. Table 4.18 shows initial statistics generated for the candidate critical success factors. The rule used to finally determine number of factors to include was Kaiser criterion (all factors with eigenvalues greater than one) (Kaiser, 1974) and the scree test (Figure 4.2)

explained above. For the critical success factors this resulted in a four factor solution which explains 100.00 percent of the variation (Table 4.18). Subsequently, varimax rotation with Kaiser normalization was chosen as the method of transforming the initial factors into a more meaningful configuration (Table 4.19).

Figure 4.2- Scree plot for total variance of critical success factors analyzed

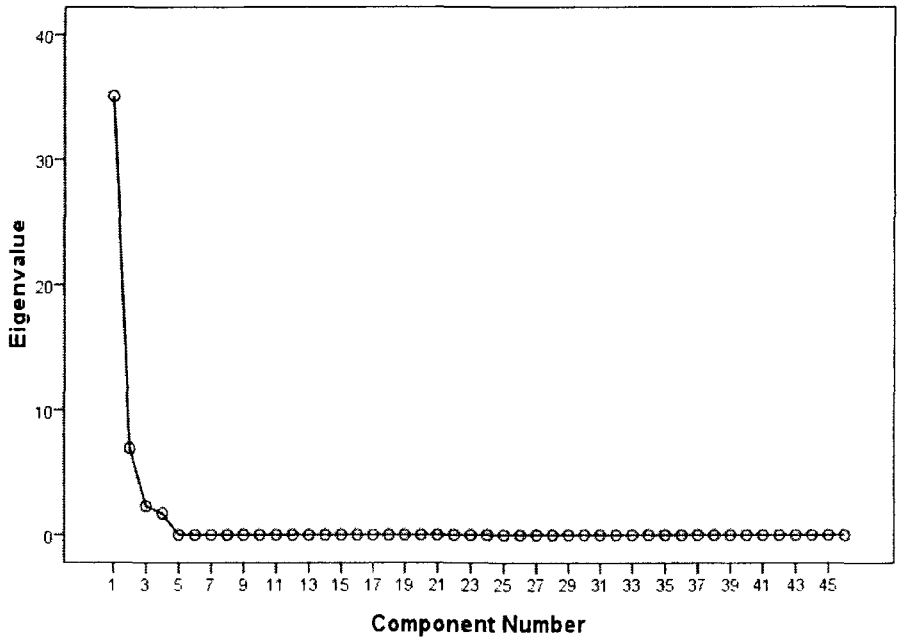


Table 4.19-Critical Success Factors – Rotated component extraction

Rotated Component Matrix[a]

#	Component			
	1	2	3	4
S1	.247	.699	.527	-.416
S2	.936	.199	.280	-.079
S3	.793	.540	.213	.183
S4	.906	.409	.030	.107
S5	.954	.050	.289	.062
S6	.772	.518	.336	.149
S7	.392	.427	.815	.023
S8	.918	.396	.033	.007
H1	.354	.890	.284	.040
H2	.434	.860	.234	.129
H3	.993	.084	.004	-.088
H4	.961	.192	.199	-.016
H5	.202	.177	.939	-.216
O1	.760	.456	.203	-.416
O2	.961	.237	.012	-.143
O4	.956	.225	.091	.166
M1	.484	.740	.430	.181

#	Component			
	1	2	3	4
M2	.823	.380	.381	.182
M3	.575	.771	.268	.056
M4	.981	.176	.064	-.055
M5	.074	.797	.592	-.088
M6	-.032	.793	.573	.204
M7	.797	.591	.122	.030
F1	.563	.777	.277	-.048
F2	.230	.841	.482	.082
F3	.678	.657	.286	.161
F4	.546	.790	.117	.254
F5	.836	.539	.102	.001
F6	.568	.773	.111	.260
F7	.939	.336	.051	.058
E1	.078	.532	.300	.788
E2	.381	.885	.245	.110
E3	-.153	.478	.825	.258
E4	.871	.397	.266	.112
E5	.725	.199	.642	.149
E6	.712	.673	.105	.172
I1	.631	.464	.613	.108
I2	-.029	.399	.885	.239
I3	.404	.720	.531	-.190
I4	.686	.647	.244	.226
I5	.461	.388	.633	.486
I6	.397	.772	.472	.155
N1	.887	.444	.129	.014
N2	.924	.362	.094	.082
N3	.683	.666	.256	-.159
N4	.959	.210	.180	.059

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

= Critical Success Factors used in data analysis as given below :

S1 = Physical Infrastructure; S2=Technology, S3=Support Services / Systems, S4=Management Commitment, S5=Organizational Effectiveness, S6=Business flexibility (Strategic), S7=Partners / Collaborators / Enablers, S8=Corporate ethics, H1=Availability, H2=Employability, H3=Skills & Attitude, H4=Domain Knowledge, H5=HR practices, O1=Process Management, O2=Quality Systems, O3=Global Delivery Footprint (Operational Flexibility, Customer Focused Delivery, M1=Depth of Services, M2=Unique Positioning Advantage, M3=Business Flexibility (Marketing), M4=Customer Relationships & Management, M5=Sales Force Size & Productivity, M6=Sales Force Geographic presence, M7=Customer Satisfaction Feedback, F1=Investment, F2=Access to Capital markets, F3=Cost Structure, F4=Revenue Stream, F5=Cash Flow Management, F6=Sustenance, F7=Customer focused Practices, E1=Political, E2=Economic (Internal to the organization), E3=Socio cultural, E4=Technological, E5=Global business cycle, E6=Regulatory, I1=Threat of Substitute Products / Services, I2=Threat of New Entrants, I3=Competitive Rivalry Within Industry, I4=Bargaining Power of Buyers, I5=Bargaining Power of Suppliers, I6=Bargaining Power of Complementors, N1=Service Innovation, N2=Operational Innovation, N3=Marketing Innovation, N4=Technological Innovation.

Factor loadings resulting from the varimax rotation were evaluated using the threshold of 0.35, level recommended by Churchill (1979). Only items with factor loadings of 0.35 and above were considered to be included under each of the factors of the four factor solution. Table 4.20 shows the factor loadings of the final factors selected for each of critical success factors.

Table 4.20- Critical Success Factors and their factor loadings

Sl.	Code	CSF	F1*	F2*	F3*	F4*
1	H3	Skills & Attitude	0.993			
2	M4	Customer Relationships & Management	0.981			
3	O2	Quality Systems	0.961			
4	H4	Domain Knowledge	0.961			
5	N4	Technological Innovation	0.959			
6	O4	Global Delivery Footprint (Operational Flexibility, Customer Focused Delivery	0.956			
7	S5	Organizational Effectiveness	0.954			
8	F7	Customer focused Practices	0.939			
9	S2	Technology	0.936			
10	N2	Operational Innovation	0.924			
11	S8	Corporate ethics	0.918			
12	S4	Management Commitment	0.906			
13	N1	Service Innovation	0.887			
14	E4	Technological	0.871			
15	F5	Cash Flow Management	0.836			
16	M2	Unique Positioning Advantage	0.823			
17	M7	Customer Satisfaction Feedback	0.797			
18	S3	Support Services / Systems	0.793			
19	S6	Business flexibility (Strategic)	0.772			
20	O1	Process Management	0.760			
21	E5	Global business cycle	0.725			
22	E6	Regulatory	0.712			
23	I4	Bargaining Power of Buyers	0.686			
24	N3	Marketing Innovation	0.683			
25	F3	Cost Structure	0.678			
26	I1	Threat of Substitute Products / Services	0.631			
27	H1	Availability		0.890		
28	E2	Economic (Internal to the organization)		0.885		
29	H2	Employability		0.860		
30	F2	Access to Capital markets		0.841		
31	M5	Sales Force Size & Productivity		0.797		
32	M6	Sales Force Geographic presence		0.793		
33	F4	Revenue Stream		0.790		

Sl.	Code	CSF	F1*	F2*	F3*	F4*
34	F1	Investment		0.777		
35	F6	Sustenance		0.773		
36	I6	Bargaining Power of Complementors		0.772		
37	M3	Business Flexibility (Marketing)		0.771		
38	M1	Depth of Services		0.740		
39	I3	Competitive Rivalry Within Industry		0.720		
40	S1	Physical Infrastructure		0.699		
41	H5	HR practices			0.939	
42	I2	Threat of New Entrants			0.885	
43	E3	Socio cultural			0.825	
44	S7	Partners / Collaborators / Enablers			0.815	
45	I5	Bargaining Power of Suppliers			0.633	
46	E1	Political				0.788

* F1 = Factor loading of Component 1 identified after rotated component extraction.

* F2 = Factor loading of Component 2 identified after rotated component extraction.

* F3 = Factor loading of Component 3 identified after rotated component extraction.

* F4 = Factor loading of Component 4 identified after rotated component extraction.

Based on information arrived at (under table 4.20), and by logically grouping the identified critical success factors under the four factor solution we can name the identified four factors accordingly. The inherent nature of elemental critical success factors and the overall themes they reflect gives us a direction in naming the groups accordingly. The factor loadings have been summed to arrive at the factor scores for each of the factors identified, grouped and named in the four factor solution. Table 4.21 shows named factors and their factor loading scores for the four factor solution.

Table 4.21- Four Factor Solution – Factor names and scores

FACTORS	FACTOR NAMES	FACTOR SCORES
F1	Customer Factor	22.039
F2	Organization Factor	11.109
F3	Industry/Sectoral Factor	4.097
F4	Environmental Factor	0.788

Table 4.21 shows the factor loading scores of the final elemental critical success factors selected for each of four factors solution.

All Elemental Critical Success Factors under the first factor (F1) called the "**Customer Factor**" have to do with customers and include systems, processes and inherent characteristics that are required to provide, expected quality services and meet customer expectations. They include Elemental Critical Success Factors such as

– Skills & Attitude, Customer Relationships & Management, Quality Systems, Domain Knowledge, Technological Innovation, Global Delivery Footprint, Operational Flexibility, Customer Focused Delivery, Organizational Effectiveness, Customer focused Practices, Technology, Operational Innovation, Corporate ethics, Management Commitment, Service Innovation, Technological, Cash Flow Management, Unique Positioning Advantage, Customer Satisfaction Feedback, Support Services / Systems, Business flexibility, Process Management, Global business cycle, Regulatory, Bargaining Power of Buyers, Marketing Innovation, Cost Structure and Threat of Substitute Products / Services.

Firms are advised to ensure the above indicated factors are available to survive and grow in this industry domain.

Elemental Critical Success Factors under the second factor (F2) called the "**Organization Factor**" have to do with the structure, function, essentiality and consists of "ingredients" an organization has to exhibit and provide to survive and grow in this industry climate. They include Elemental Critical Success Factors such as – Availability, Economic (Internal to the organization), Employability, Access to Capital markets, Sales Force Size & Productivity, Sales Force Geographic presence, Revenue Stream, Investment, Sustenance, Bargaining Power of Complementors, Business Flexibility, Depth of Services, Competitive Rivalry Within Industry, Physical Infrastructure.

All Elemental Critical Success Factors under the third factor (F3) called the "**Industry/Sectoral Factor**" have to do with the industry or sector characteristics and its unique influences in permitting an organization to survive and grow. They include Elemental Critical Success Factors such as – HR practices, Threat of New Entrants, Socio cultural, Partners / Collaborators / Enablers, Bargaining Power of Suppliers.

The last component of the four factors solution consists of the fourth factor (F4) called the **"Environmental factor"** and includes the elemental critical success factor Political. This is but natural since the political environment and hence governmental policies will directly and indirectly impact this industry due to the nature of the business. Customers from different geographies would primarily seek out more efficiencies and hence outsource existing processes thereby reducing the demand for those kinds of jobs in their own country. On the other hand, due to increased

efficiencies, the direct and indirect advantages ensure that high value jobs are created and available in their own countries.

4.3. Comparative Study

This part describes the comparative study component undertaken in this research. It first describes the construction of a generic business model framework, based on data derived from analysis completed above. On completion of constructing the generic business model framework for life science BPO organizations, research hypothesis of this research study were tested. The part also describes the comparative study undertaken, post confirmation of the relationship between business performance and business models for this specific industry sector.

4.3.1. Business Performance

In the final analysis, the most critical business performance and success factor is the returns shareholders get for their investment. Also, the primary objective of managers is to maximize the returns of shareholders investment in an organization. Based on the above and also on literature research the market based measure returns to shareholders (RTS) was selected in this study to represent business performance and success of an organization.

The logic of this performance metric is that it calculates the economic income to investors for specified time periods. As a performance metric, it compares the economic returns to investors in a firm relative to alternative benchmark investments. This study focuses on comparisons between individual organizations based on RTS values calculated from financial data for the period 2010 – 2011, and does not focus on comparisons against a benchmark.

The RTS ratio is one of the most important ratios used for measuring the overall efficiency of a firm. As the primary objective of business is to maximize its earnings, this ratio indicates the extent to which this primary objective of businesses is being achieved. This ratio is of great importance to present and prospective shareholders as well as the management of the company.

As the ratio reveals how well the resources of the firm are being used, higher the ratio, better are the results and hence better the organization's performance. The inter-firm comparison of this ratio determines whether the investments in the firm are attractive or not as the investors would like to invest only where the return is higher.

Out of the 243 useful responses received, a total of 117 respondents had indicated either the division in which they were working and or the organization to which they were affiliated. A total of 28 BPO and 18 CRO service provider organizations were selected from the above 117 respondents based on the following criteria, for this stage of data analysis :

a) The organization is either an independent organization or a strategic business unit within a multiple business organization in the Life Sciences industry – Pharmaceuticals, Biotechnology, Generics manufacturing, Clinical Research organization, IT services provider to the Life Sciences industry or BPO service provider to the Life Sciences industry that outsources business processes.
b) Required financial information of the organization is readily available in public domain.

RTS value was calculated using the standard formula [Return on share holder's investment = {Net profit (after interest and tax) / Share holder's fund} × 100] for individual organizations. The obtained results were tabulated after ranking to arrive at the information presented under table 4.22 given below.

Table 4.22- Hierarchy list of organizations based on Business Performance

Sl.	Organizations*	RTS Value	Ranking based on RTS Value
1	BP1	66.38	1
2	BP10	64.38	2
3	BP11	60.42	3
4	BP2	58.44	4
5	BP3	49.53	5
6	BP4	48.38	6
7	BP5	46.79	7
8	BP6	44.72	8
9	BP7	42.44	9
10	BP8	34.91	10
11	BP9	32.99	11
12	C1	32.68	12

Sl.	Organizations*	RTS Value	Ranking based on RTS Value
13	C10	30.44	13
14	C2	27.84	14
15	C3	25.79	15
16	C5	19.03	16
17	C7	16.17	17
18	C8	14.62	18
19	C9	13.28	19
20	C11	11.46	20
21	C13	8.75	21
22	BP13	8.02	22
23	BP14	7.57	23
24	BP15	7.44	24
25	BP16	7.09	25
26	BP17	6.72	26
27	BP18	4.39	27
28	BP20	3.94	28
29	BP22	3.53	29
30	BP23	3.32	30
31	BP24	2.76	31
32	BP25	2.56	32
33	BP26	2.43	33
34	BP27	2.16	34
35	BP28	2.10	35
36	C14	1.86	36
37	C15	1.64	37
38	C16	1.39	38
39	C18	1.12	39
40	C17	-1.13	40
41	BP21	-3.93	41
42	BP19	-4.00	42
43	BP12	-8.73	43
44	C12	-11.30	44
45	C6	-17.75	45
46	C4	-19.80	46

*C = CRO; BP=BPO organizations

Based on ranking of the organizations considering their RTS value, it is evident that BPO organizations are better performers than the CRO organizations in terms of RTS.

The top 11 rankings consecutively in the above table are for BPO organizations followed by 10 CRO's and subsequently, 13 BPO's have a consecutively higher rank compared to 5 CRO's in terms of their RTS value.

This could be possible since the timelines for cash realization is longer for a CRO when compared to a BPO, as projects executed by the CRO's and attainment of project performance milestones are of a longer duration. But, overall from the business performance perspective it does become evident that BPO's have a better business performance model when compared to the CRO's.

4.3.2. Development of a Generic Business Model Framework

Brace et al.. (2006) explain, if two variables are correlated, then knowing the score on one variable will allow us to predict the score on the other variable, and stronger the correlation the closer the scores will fall to the regression line and therefore more accurate the prediction and that multiple regression is simply an extension of this principle, where we predict one variable on the basis of several other variables. Hence, using multiple regression we can test theories (or models) about precisely which set of variables ("Independent or Predictor variables") is influencing the behavior of another variable ("Dependent variable").

They also emphasize that this statistical technique can be used when exploring linear relationships between the predictor and dependent variables when the relationship follows a straight line and when the number of cases (participants) substantially exceed the number of predictor variables being used in regression. The absolute minimum is that we have five times as many participants as predictor variables but a more acceptable ratio is 10:1. In this part of the study the number of cases, participants are 46 factors and the number of predictor variables being tested is 4.

On applying the multiple regression method using the "enter" option, with business performance (RTS – Table 4.22) as the dependent variable and Customer Factor, Organization Factor, Industry/Sectoral Factor and Environmental Factor as the independent/predictor variables, the following significant model emerged, values of which are presented under Table 4.23 below :

$$\mathbf{F_{4,41} = 21.952,\ p < 0.0005.\ Adjusted\ R\ square = 0.651.}$$

The table below along with the information presented illustrate that the represented model accounts for 65.10 percent of variance (adjusted R square value) and the overall significance of the model is less than 0.0005 (p value).

Table 4.23- Multiple regression model summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.826[a]	.682	.651	13.17440	.682	21.952	4	41	.000

a. Predictors: (Constant), F4_Loading, F3_Loading, F2_Loading, F1_Loading
b. Dependent Variable: RTS (Returns to shareholders)

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15240.197	4	3810.049	21.952	.000[a]
	Residual	7116.158	41	173.565		
	Total	22356.355	45			

a. Predictors: (Constant), F4_Loading, F3_Loading, F2_Loading, F1_Loading
b. Dependent Variable: RTS (Returns to shareholders)

The Analysis of Variance (ANOVA) table above also helps us understand the overall significance of our model which is $p<0.0005$.

Table 4.24- Significant independent variables

Sl.	Independent /Predictor Variable	Beta	p value
1	Customer Factor (F1)	2.486	< 0.0005
2	Organization Factor (F2)	1.729	< 0.0005
3	Industry/Sectoral Factor (F3)	1.164	< 0.0005
4	Environmental Factor (F4)	.548	< 0.0005

Significant predictor variables of the model are shown in Table 4.24 above. According to Brace et al., (2006) the beta value (standardized regression coefficients) is a measure of how strongly each independent/predictor variable influences the dependent variable. Based on this, we can conclude that the independent variable Customer factor with a beta value of 2.486 and a p of < 0.0005 has the greatest impact

on business performance. This is followed by the Organization factor (beta = 1.729; p < 0.0005) and the Industry/Sectoral Factor (beta = 1.164; p < 0.0005). It also emerges that the Environmental factor (beta = 0.548; p < 0.0005) has the least influence on business performance when compared to the other three independent variables.

Table 4.25- Regression Coefficients and their Significance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-81.725	15.096		-5.414	.000
	F1_ Customer Factor	129.788	17.932	2.486	7.238	.000
	F2_ Organization Factor	105.812	19.384	1.729	5.459	.000
	F3_ Industry/Sectoral Factor	99.756	19.488	1.164	5.119	.000
	F4_ Environmental Factor	105.134	25.427	.548	4.135	.000

a. Dependent Variable: Buss_Perform

According to Gaur and Gaur (2006), the regression coefficients and their significance obtained by applying multiple regression procedure on the available data (represented in Table 4.25 above), can be used to construct an ordinary least squares(OLS) equation. This equation is constructed by using the "Constant" corresponding to the un-standardized "B" value and standardized coefficients "Beta" values for four factors (F1, F2, F3, F4) presented in table 4.25 above. The equation is represented below :

Business Performance(RTS) = -81.725 + 129.788 (F1) + 105.812 (F2) + 99.756 (F3) + 105.134 (F4).

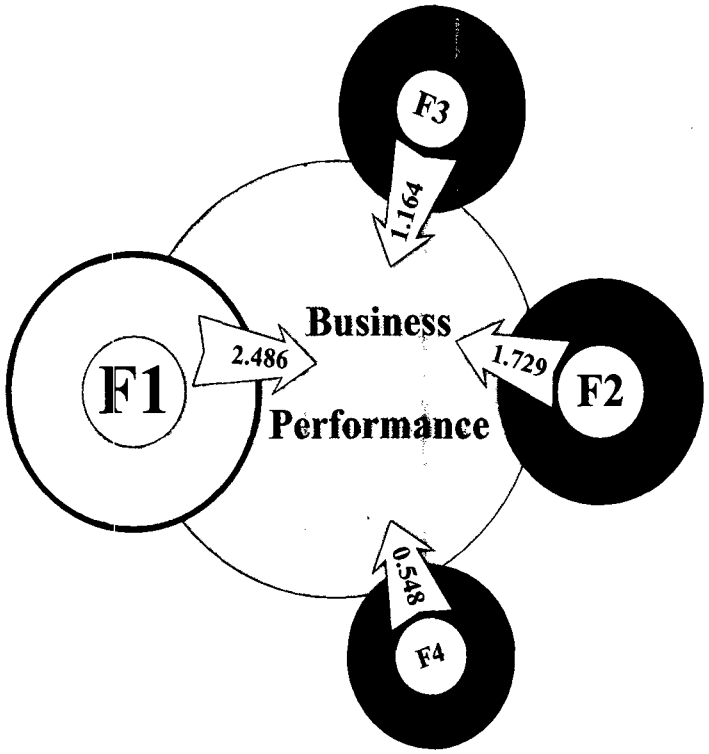
where F1= Customer Factor; F2= Organization Factor; F3= Industry/Sectoral Factor; F4= Environmental Factor.

The model above (ordinary least squares(OLS) equation) represents the "quantitative influence" of the four individual factors in the four factor solution to predict business performance of organizations in the Life Sciences BPO industry domain. In other words, it also represents the generic / reference business model framework which

reflects the relationships of elements (critical success factors) and their effect on industry performance of businesses in the Life Sciences BPO Industry Domain.

A visual depiction of this model is presented as Figure 4.3 given below :

Figure 4.3- Confirmatory Generic Business Model Framework

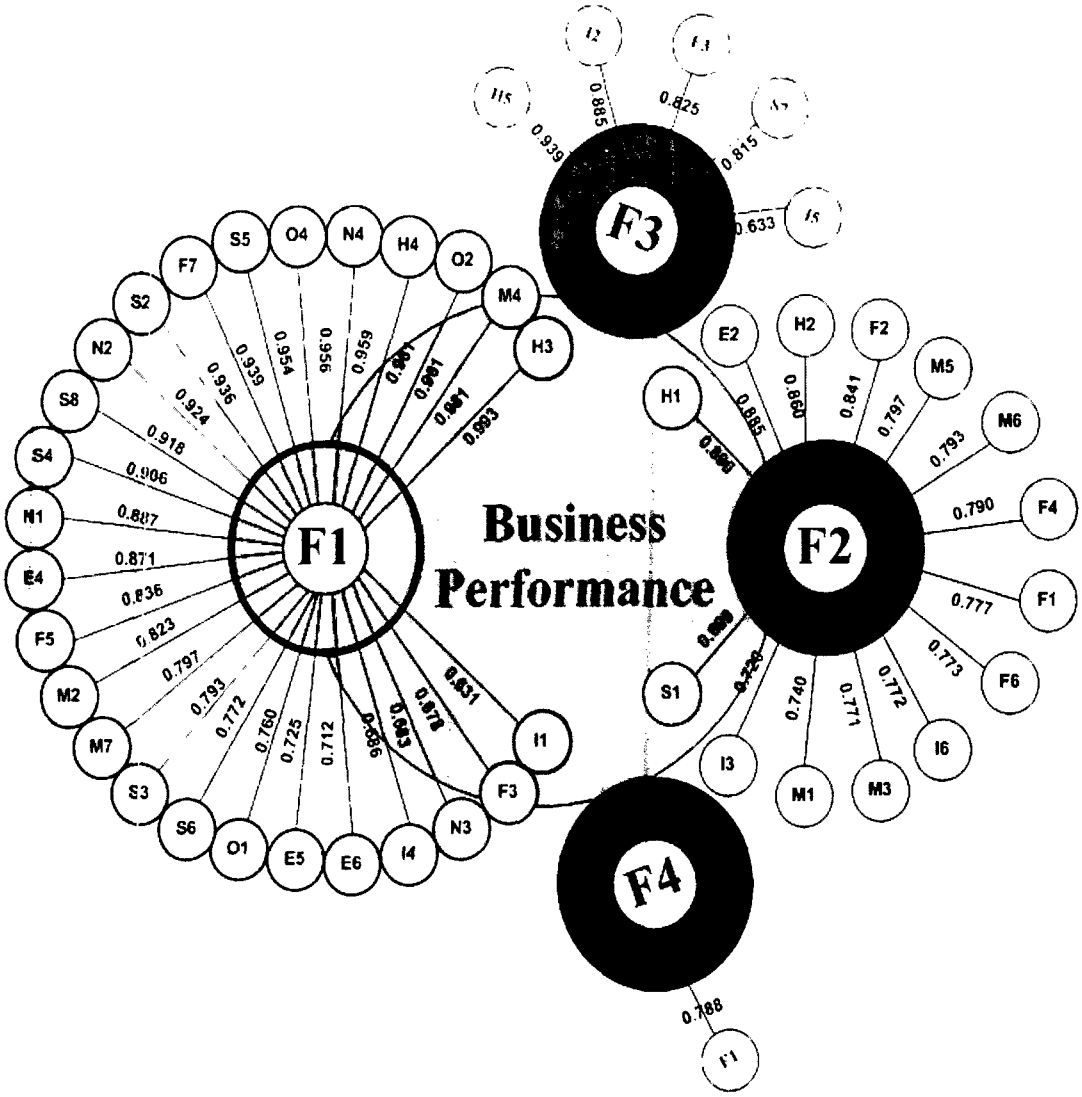


Factor (F1) – Customer Factor of the four factor solution arrived after factor reduction, has the maximum influence on business performance of an organization belonging to the Life Sciences BPO industry segment. Next is F2 or the organization factor, followed by F3 or the Industry/Sectoral factor. The factor which has the least influence amongst all the four factors is the Environmental Factor or F4.

The above figure presents a broad overview or representation of business model factors and their influence on business performance and success of organizations belonging to the Life Sciences specific BPO Industry.

A more detailed visual depiction of this model including all 46 elemental CSF's and their quantitative influence on business performance and success is presented under Figure 4.4 given below.

Figure 4.4- Generic Business Model Framework for Life Sciences BPO Industry



F1=Customer Factor; F2=Organization Factor; F3=Industry/Sectoral Factor; F4=Environmental Factor.

H3=Skills & Attitude; M4=Customer Relationships & Management; O2=Quality Systems;H4=Domain Knowledge; N4=Technological Innovation; O4=Global Delivery Footprint (Operational Flexibility, Customer Focused Delivery); S5=Organizational Effectiveness; F7=Customer focused Practices; S2=Technology; N2=Operational Innovation; S8=Corporate ethics; S4=Management Commitment; N1=Service Innovation; E4=Technological; F5=Cash Flow Management; M2=Unique Positioning Advantage; M7=Customer Satisfaction Feedback; S3=Support Services / Systems; S6=Business flexibility (Strategic); O1=Process Management; E5=Global business cycle; E6=Regulatory; I4=Bargaining Power of Buyers; N3=Marketing Innovation; F3=Cost Structure; I1=Threat of Substitute Products / Services; H1=Availability; E2=Economic (Internal to the organization); H2=Employability; F2=Access to Capital markets; M5=Sales Force Size & Productivity; M6=Sales Force Geographic presence; F4=Revenue Stream; F1=Investment; F6=Sustenance; I6=Bargaining Power of Complementors; M3=Business Flexibility (Marketing); M1=Depth of Services; I3=Competitive Rivalry Within Industry; S1=Physical Infrastructure; H5=HR practices; I2=Threat of New Entrants; E3=Socio cultural; S7=Partners / Collaborators / Enablers; I5=Bargaining Power of Suppliers; E1=Political.

At the center of this figure lies business performance, illustrated as a huge circle. Big circles surrounding this with the descriptions of F1, F2, F3, F4 (corresponding to Customer Factor, Organization Factor, Industry/Sectoral Factor, Environmental

Factor respectively) represent individual themes arrived at from the EFA(four factor solution) stage of the study. Smaller circles connected through lines to these "big theme circles", with descriptions like H1, O4, F2 etc., represent elemental CSF's corresponding to elemental CSF's categorized / thematized under one of the four themes obtained from the four factor solution.

The numbers (values) on the lines connecting elemental CSF's to their parent themes represent the strength of influence of that particular elemental CSF on that specific theme. Hence these numbers indicate the magnitude of influence a particular elemental CSF has on the theme and hence business performance and success. For example, the magnitude of influence of elemental CSF H3 is 0.993 on theme F1 compared to that of N3 which has a magnitude of 0.683. This shows that the quantitative influence of elemental CSF H3 is 0.993 on F1 when compared to that of elemental CSF N3 which has a quantitative influence of only 0.683 on the theme or factor F1.

Stronger the theme's effect on business performance and success, larger is its overlap with the business performance circle in the illustration above. For example, since theme F1 has the most influence on the outcome (business performance, success) the amount of overlap of the F1 circle with the Business performance circle is larger compared to that of theme F4.

The study was also designed to understand the difference in construction of the generic business models framework based on results obtained through exploratory and confirmatory or quantitative data analysis as described above. When Figures 5.a - (Exploratory Generic Business Model Framework (EGBMF)) and 5.2 (Confirmatory Generic Business Model Framework (CGBMF)) are compared, it is evident that EGBMF comprises of 8 major themes affecting business performance in this specific industry. Out of the 46 elemental CSF's included in this theme, the major contributors of the influence (on business performance) include the following : for Operations - Global Delivery Footprint, Innovations - Technological innovation; Strategy - Management commitment; Human resources - Skills & Attitudes; Finance - Customer Focused practices; Marketing - Customer Relationship & Management; Environment – Regulatory; Industry - Bargaining power of buyers.

On the other hand, although CGBMF also comprises 46 elemental CSF's, the results show that only 4 themes (Customer Factor, Organization Factor, Industry Factor and Environment Factor) influence business performance of organizations in this industry. The main elemental CSF's influencing the business performance under these four themes are skills and attitude, availability of resources, HR practices and Political respectively.

In summary, we can conclude that exploratory data analysis helped in attaining a broad understanding of elemental CSF's and their relationships, whereas confirmatory data analysis helped construct a more refined empirical model of a generic business model framework which can be applied quantitatively by organizations belonging to this specific industry segment.

4.4. Testing of Hypothesis

As noted earlier under Chapter 2, although existing literature refers to the effect of business model on business and industry performance Malone et al. (2006), Zott and Amit (2002), there was very limited literature on identified critical success factors, their relationships and effects on business performance in Life Sciences BPO Industry. Moreover, there were no published literature on identifying critical success factors affecting business performance and their relationships specifically with reference to the Indian Life Sciences BPO Industry. The reviewed literature on business models for the Life sciences BPO industry provides only a limited scope to identify significant themes and derive satisfactorily theoretical items / categories / components (critical success factors) affecting business performance.

Due to this limitation, the study was designed and research carried out to identify elemental critical success factors, their category themes, relationships between these elemental critical success factors and their effect on business performance of Life Sciences BPO Industry. After identifying the critical success factors, their relationships and the nature of their effect on business performance, the following hypothesis were tested.

- Null hypothesis (H_0) : An organizations' business performance is independent of its business model.

- Alternate hypothesis (H_A) : An organizations' business performance depends on its business model.

To test the above hypothesis, the strength of the relationship between two variables, RTS values obtained from factual financial data(presented under Table 4.22) and scores obtained for organizational business models were tested. The scores for organizational business models were considered from responses of 46 individual respondents of organizations out of a total of 28 BPO and 18 CRO service provider organizations selected from 117 respondents.

Pearson's test for bivariate correlation was utilized to test for correlation between the above indicated variables. Results of this test is presented as Table 4.26 below.

Table 4.26- Association between Business models and Business Performance

Sl	Particulars	Pearson Correlation	Sig. (2-tailed)	N
1	RTS from Financial Data	1.000	.	46
2	Respondents Score	0.689**	0.000	46

**. Correlation is significant at the 0.01 level (2-tailed).

When one interprets results of the Pearson's correlation test presented under Table 4.26, it becomes evident that there is correlation between Business Performance (RTS value) and Business Models (Respondent Scores). We can observe that the correlation coefficient between Business Performance and Business Models is 0.689 and the p value for two-tailed test of significance is less than 0.0005. From this we conclude that there is a positive correlation between Business Performance and Business models at the significance level of 0.01.

Due to this, we reject the null hypothesis H_0 which in turn means that Life Sciences BPO organizations business performance is dependent on its business model.

Since this research study is exploratory to a limited extent in nature, it was not possible to develop a more comprehensive set of a priori hypotheses. However, an initial working hypothesis as described above was arrived at and post conduct of the

exploratory factor analysis, the factors observed as a result of the factor solution were used to construct further working hypothesis as described below.

On identifying elemental CSF's, analyzing the themes and exposing this data set to exploratory factorial analysis, we arrived at a four factor solution as described under Section 4.2.2. Further, to have a better insight into critical success factors, and the four component factors of the four factor solution's effect on business performance, the following set of working hypothesis (Null(H_{0n}) and Alternate (H_{An}) where n = 1, 2,.....x) were formed and tested.

- H_{01} : An organizations' business performance is independent of "Customer Factor".
- H_{A1} : An organizations' business performance depends on its "Customer Factor".

According to Gaur and Gaur (2006), if the null hypothesis states that there is no relationship (independent) between variables under study, (in this case business performance and "Customer Factor") the beta coefficient is not different from zero.

When we were to refer to the beta coefficient value for the Customer Factor (F1) presented under Table 4.25 (Regression Coefficients and their Significance), it is evident that the beta value for this factor is 2.486 at a significance of <0.0005 (p value). Since the beta value is not equal to zero, we reject the null hypothesis H_{01} and accept the alternate hypothesis.

So, we conclude that the business performance of an organization is related to or dependent on its "Customer Factors".

- H_{02} : An organizations' business performance is independent of "Organization Factor".
- H_{A2} : An organizations' business performance depends on its "Organization Factor".

Similarly, as described above, the beta coefficient and p values for Organization Factor (F2) are 1.729 and < 0.0005 respectively (Table 4.25 - Regression Coefficients and their Significance), due to which we reject the null hypothesis

H_{02} and conclude that performance of an organization is related to or dependent on its "Organization Factors".

- H_{03} : An organizations' business performance is independent of "Industry/Sectoral Factor".
- H_{A3} : An organizations' business performance depends on its "Industry/Sectoral Factor".

The beta coefficient and p values for Industry/Sectoral Factor (F3) are 1.164 and < 0.0005 respectively (Table 4.25 - Regression Coefficients and their Significance). Due to this we reject the null hypothesis H03 and conclude that performance of an organization is related to or dependent on its "Industry/Sectoral Factors".

- H_{04} : An organizations' business performance is independent of "Environmental Factor".
- H_{A4} : An organizations' business performance depends on its "Environmental Factor".

For Environmental Factor (F4) the beta coefficient value is 0.548 and $p < 0.0005$ (Table 4.25 - Regression Coefficients and their Significance). Based on this we reject the null hypothesis H04 and conclude that performance of an organization is related to or dependent on its "Environmental Factors".

The above provides us with sufficient evidence to conclusively conclude that business performance of any organization in the Life Sciences BPO Industry domain depends positively on Customer Factor, Organization Factor, Industry/Sectoral Factor and Environmental Factors. Since these are constituent of business models unique to this industry segment we conclude that business performance of Life Sciences BPO organizations depend on their business models.

4.5. Comparative Analysis

After the process of elemental critical success factors identification, categorization under specified themes, reduction of these factors to identify factors based solution/s (where we obtained a four factor solution), a generic/reference business model framework which exhibits these reduced factors and their relationships was

constructed. Hypothesis testing was also carried out considering the factors identified and their relationships.

On completion of hypothesis testing, the next conclusive step in this study was to compare the values obtained by applying the generic business model to values of business performance obtained using factual data to individual organizations.

Rank based hierarchical lists were constructed using data collected through :

- Completed, useful comparative analysis questionnaire received from 33 respondents ("Hierarchy list of organizations based on the Generic Business Model") and
- By obtaining market performance metric Returns to shareholders (RTS) based on factual financial data ("Hierarchy list of organizations based on RTS Market Performance Measure").

The first part of this comparative analysis was carried out on data received through 33 useful survey responses. Survey responses of each respondent from the specific organization were used to "run" the constructed generic business model framework described above. The output of this process was the " predicted business performance metric (RTS)". This corresponds to the anticipated business performance or success value for that particular organization based on available/existing essential, elemental CSF's in that particular organization. These existing elemental CSF correspond to those identified by the four factor solution as essential for business performance of India based Life Sciences BPO organizations.

A second questionnaire (enclosed under Annexure V) was created by utilizing elemental critical success factors identified by the four factor solution arrived at through Exploratory Factor Analysis. These identified factors were placed in the same sequence as dictated by the four factor solution based on the individual factor loading value of the individual elemental critical success factors. Essential verbal modification of these elemental critical success factors to ensure a better understanding of each of these elemental factors were only applied for creating this questionnaire for comparative analysis. The verbal modification was strictly enforced to introduce a more sentence based critical success factors description since the questionnaire was exposed to respondents as is, without further categorization under specific themes.

This questionnaire was sent to pre-selected organizations and respondents working in those specific organizations which were selected based on the criteria described under Section 3.8.4 (Comparative Study Data Collection).

The organization selection criteria were defined to ensure that the researcher would have direct access to unbiased, statutory information to help evaluate business performance based on selected financial parameters. The respondents' criteria were defined to ensure that they have the best knowledge about the Life Science outsourcing industry and have direct experience with the outsourcing function and hence were capable of providing useful inputs.

Considering the sample size required, costs and disadvantages of postal survey, it was decided that an electronic survey would be more appropriate, given that the target respondents would all have internet access.

The e-mail addresses of the respondents who satisfied the indicated criteria were identified online primarily on the LinkedIn Professional Group "Life Sciences Outsourcing" and through the researcher's networks and several outsourcing online networks in LinkedIn. Professional groups in LinkedIn with entry gate criteria (exclusive group admission only for Professionals in the outsourcing industry) and specific to India based populations were selected to complete the sample frame. Mechanics of questionnaire administration followed the procedure defined under Section 3.7.1 above.

Using the above described screening process, around 45 potential respondents based out of India and working for India based organizations were identified and online solicitations to participate in the survey was sent. The online survey preparation and conduct was initiated on July 4th, 2011 and completed on the 27th of August 2011.

In total, 45 invitations were sent out to a much focused sample frame and at the end of the survey window, 36 responses were submitted/received. The response rate was 73.35% as only 33 of the received responses were considered usable since 3 incomplete responses were lost for follow-up. The response rate for this survey is high due to the fact that the sample size was small and there was a vigorous follow-up through personal calls to ensure the survey was completed and returned.

Demographic details of these 33 respondents are represented in Table 4.27 and Figure 4.11 under Annexure VI.

Table 4.27- Comparative Analysis – Respondents Industry profile (India)

Sl.	Industry	Frequency	Percent
1.	Clinical Research Organizations (CRO)	14	42.50
2.	Business Process Outsourcing Service Providers (BPO)	19	57.50
	TOTAL	33	100.0

On completion of the survey window, data collected was cleaned as mentioned previously and made ready for further analysis. The questionnaire was designed such that the respondents had to answer either YES or NO to each of the questions based on the availability of that particular factor, parameter, competency etc., in their organizations. Each YES was scored 1 and NO a zero. These values indicate existence or non-existence of specific essential CSF's which influence business performance and success of Indian Life Sciences BPO Industry.

The sum of the above responses corresponding to each of the four factors were then calculated and used for further analysis. The quantitative generic business model framework was applied to the calculated response values as described to each of the 33 responses. The difference in these derived values indicate essential CSF's existing in an organization and hence the uniqueness of that specific organization's business model in this specific industry segment.

Based on the above, the identified 21 unique business models are presented in table 4.28 below.

Table 4.28- Existing Business Models in Indian Life Sciences BPO Industry

Business Models[$]	Organizations*	F1[#]	F2[#]	F3[#]	F4[#]	Predicted Business Performance Value
BMOD1	BP5; B13; B17	11	8	0	0	2192.439
BMOD2	CR9; CR13	10	7	3	0	2256.107
BMOD3	CR7	11	6	3	1	2385.217
BMOD4	CR8	13	5	4	0	2533.603
BMOD5	CR6; CR12	15	7	0	0	2605.779
BMOD6	CR3	16	6	2	0	2829.267
BMOD7	CR4	14	9	2	0	2887.127

Business Models[$]	Organizations*	F1[#]	F2[#]	F3[#]	F4[#]	Predicted Business Performance Value
BMOD8	CR5; CR14	15	8	3	0	3010.859
BMOD9	CR2	18	6	3	1	3293.733
BMOD10	BP4; BP12; BP16	19	6	3	1	3423.521
BMOD11	BP2; BP14	22	13	5	0	4647.947
BMOD12	BP6	23	11	5	1	4671.245
BMOD13	BP3; BP15	22	13	5	1	4753.081
BMOD14	CR10; CR11	22	14	4	1	4759.137
BMOD15	BP10; BP19	24	12	4	1	4807.089
BMOD16	CR1	25	11	4	1	4831.065
BMOD17	BP1	22	14	5	1	4858.893
BMOD18	BP8	23	13	5	1	4882.869
BMOD19	BP11	24	13	4	1	4912.901
BMOD20	BP9;BP18	25	13	4	1	5042.689
BMOD21	BP7	25	13	5	1	5142.445

*CR = CRO; BP= BPO organizations

= F1=Customer Factor: F2=Organization Factor: F3=Industry/Sectoral Factor: F4=Environmental Factor.

$ = BMOD1=Business Model Type 1: BMOD2= Business Model Type 2; etc.. up to BMOD21= Business Model Type 21

Out of 33 derived values depicting 33 different organizations specific business models, only 21 business models were identified as unique (non-duplicate derived business model values) as presented in the Table 4.28 above. Data presented also helps us better understand the differences or uniqueness of the business models of specific organizations. For example, BMOD1 is Business Model type 1 and consists 11 essential CSF's out of 26 essential CSF's of the Customer factor(F1) theme, 8 essential CSF's out of 14 essential CSF's of the Organization factor (F2) theme, 0 essential CSF's out of 5 essential CSF's of the Industry/Sectoral factor (F3) theme and 0 essential CSF's out of 1 essential CSF of the Environment factor (F4) theme. These characteristics of the business model are exhibited by Indian BPO organizations BP5; B13 and B17. Based on these characteristics, the generic business model framework value obtained for this specific business model was 2192.439.

In other words, business models having the above characteristics would have a predicted business performance and success value (RTS) of 2192.439. So, a higher

generic business model framework value indicates that the specific business model would help the organization perform better compared to other organizations with different business models.

The above identified 21 unique business models were then compared and ranked based on the predicted business performance value to obtain a hierarchy list of organizations called – "Hierarchy list of organizations based on the Generic Business Model". This is presented as Table 4.29 below.

Table 4.29-Hierarchy list of organizations based on the Generic Business Model

Sl.	Organizations*	Business Model Type[$]	Predicted RTS Values	Ranking based on Predicted RTS Values
1	BP7	BMOD21	5142.45	1
2	BP9; BP18	BMOD20	5042.69	2
3	BP11	BMOD19	4912.9	3
4	BP8	BMOD18	4882.87	4
5	BP1	BMOD17	4858.89	5
6	CR1	BMOD16	4831.07	6
7	BP10; BP19	BMOD15	4807.09	7
8	CR10; CR11	BMOD14	4759.14	8
9	BP3; BP15	BMOD13	4753.08	9
10	BP6	BMOD12	4671.25	10
11	BP2; BP14	BMOD11	4647.95	11
12	BP4; BP12; BP16	BMOD10	3423.52	12
13	CR2	BMOD9	3293.73	13
14	CR5; CR14	BMOD8	3010.86	14
15	CR4	BMOD7	2887.13	15
16	CR3; CR12	BMOD6	2829.27	16
17	CR6	BMOD5	2605.78	17
18	CR8	BMOD4	2533.6	18
19	CR7	BMOD3	2385.22	19
20	CR9; CR13	BMOD2	2256.11	20
21	BP5; BP13; BP17	BMOD1	2192.44	21

*CR = CRO; BP=BPO organizations

$ = BMOD1=Business Model Type 1; BMOD2= Business Model Type 2; etc., up to BMOD21= Business Model Type 21

From Table 4.29 it becomes clear that, on comparison of 21 unique business models of 33 different organizations, organization "BP7" (BPO Service Organization 7) with a business model of the type "BMOD21" would provide or exhibit highest business performance(Ranked 1) measured as RTS when compared to other organizations with different business models in this sample set.

Business model "BMOD21" exhibits the following characteristics:

- Consists of 44 elemental CSF's when compared to that of the required 46 elemental CSF's based on the generic business model framework
- Consists 25 out of 26 essential CSF's of the Customer factor(F1) theme,
- Consists 13 out of 14 essential CSF's of the Organization factor(F2) theme,
- Consists 5 out of 5 essential CSF's of the Industry/Sectoral factor(F3) theme
- Consists 1 out of 1 essential CSF of the Environment factor(F4) theme
- Predicted RTS value is 5142.445 out of the maximum expected (predicted) RTS value of 5378.045.

Organizations "BP9" and "BP18" both have the RTS predicted value of 5042.69 and hence have a mean ranking of 2.5, which means both these organizations have similar business models which predict similar business performance (RTS) values.

In this study, out of the 33 organizational business models compared only 21 unique business models were identified with 4 organization in the CRO (Clinical Research Organizations) group and 8 organizations in the BPO (Business Process Outsourcing Organizations) group exhibiting similar business models with similar predicted RTS values. In other words all these similar organizations should have almost similar business performance (RTS) and business success outcomes.

This is not surprising since identifying a USP for various organizations in this industry sector is quite difficult as organizations primarily differ more on quantitative terms rather than qualitative terms. For example, in terms of global operational footprint – one organization may have a presence in say 6 different geographies with 1000 employees whereas another firm may have an operational presence in say 3 geographies but with the same number of employees.

Robinson (1998) found that Returns to shareholders (RTS), a market performance measure provided the most power among ten variables tested for measuring new

venture performance. The values for RTS included both firm specific performance effects as well as general market performance effects.

An advantage of using RTS as a performance measure in empirical research is that the information is readily available for public companies. Literature survey of empirical studies also indicated that RTS was the most commonly used market-based performance measure.

The other advantages of using market-based measures, discussed in more detail under Literature Review, apply to RTS as well. To review these advantages, market-based measures include:

- The value created by both the execution on existing opportunities, as well as the risk adjusted expected value of future opportunities that have yet to be realized.
- Stockholder returns, in a well regulated and open market, are not subject to manipulation by management, while accounting-based measures can be manipulated.
- Market-based measures quickly reflect management actions and changes in the economic value of the organization in an efficient market.
- Since the value of past actions are quickly incorporated into the market value of the organization, the change in market value of the organization during a given period can be assumed to reflect the actions taken by management and changes in general market conditions during that specific time.

The primary disadvantage for using RTS as a performance measure is that the information is not readily available for privately held companies. This disadvantage has been overcome by the enforced organization selection criteria described above and used in this study.

For the second part of this comparative analysis as all the organizations selected were publicly traded appropriate sources (annual reports and stock trading exchanges – when required) were used to collect factual data to carry out the process of generating the "Hierarchy list of organizations based on RTS Market Performance Measure".

Based on this, financial data obtained from legitimate sources for each of these 21 organizations with unique business models were analyzed by applying the RTS measure and ranked based on the results obtained. The first organizations in the list of 33 organizations with similar, predicted RTS values were considered for analysis at

this point. For example, in Table 4.29 above, under serial number 2 organizations "BP9" and "BP18" exhibit similar predicted values. In this case only organization "BP9" was considered for analysis.

As the study focuses on comparing unique business models the above indicated procedure was utilized to generate the list named – "Hierarchy list of organizations based on RTS Market Performance Measure" and presented as Table 4.30 given below.

Table 4.30- Hierarchy list of organizations based on RTS Market Performance Measure

Sl.	Organizations*	RTS Value	Ranking based on RTS Value
1	BP7	90.33	1
2	BP9	45.46	2
3	BP4	44.76	3
4	BP6	33.68	4
5	BP8	26.42	5
6	C6	23.28	6
7	BP11	18.67	7
8	C8	14.96	8
9	C10	12.7	9
10	C1	12.43	10
11	BP1	11.22	11
12	BP5	-1.17	12
13	C3	-7.63	13
14	C5	-13.54	14
15	C2	-19.06	15
16	BP10	-19.22	16
17	BP2	-19.26	17
18	C4	-20.17	18
19	BP3	-30.48	19
20	C7	-48.52	20
21	C9	-54.83	21

Based on Table 4.30, organization "BP7" has an RTS value of 90.33 and a rank of 1 based on this value. This ranking is in accordance with the ranking based on predicted RTS value as indicated in Table 4.29. Rank 4 in table 4.30 corresponds to organization "BP6" whereas rank 4 in table 4.29 corresponds to organization "BP8".

To understand the above phenomenon in more detail, understanding the association between the predicted RTS value and the factual RTS value would be helpful. Hence as the next step we compare rankings based on predicted RTS value (arrived at by applying the generic business model framework to respondent data) and rankings based on factual RTS value (obtained through secondary research).

Since we had to compare two rank variables to measure the strength of association or lack of it, the Spearman's Rank Correlation statistical test was applied to both the hierarchy lists ("Hierarchy list of organizations based on the Generic Business Model"; "Hierarchy list of organizations based on RTS Market Performance Measure"). This was done to determine the association between the generic business model framework predicted RTS value conceptualized through this study and the factual market performance metric (RTS) to understand association between both these parameters if any.

The Spearman's rank-order correlation is the nonparametric version of the Pearson product-moment correlation. Spearman's correlation coefficient, (ρ, also signified by r_s) measures the strength of association between two ranked variables. In this case the working hypothesis is :

- H_{05} : There is no association between the generic business model framework based predicted RTS ranks and factual RTS based ranks of an Indian Life Sciences BPO organization.
- H_{A5} : There is association between the generic business model framework based predicted RTS ranks and factual RTS based ranks of an Indian Life Sciences BPO organization.

A Spearman's Rank Order correlation was run to determine the relationship between 21 organizations' generic business model framework predicted RTS value and factual RTS derived data. Results of the analysis are presented in Table 4.31 given below.

Table 4.31- Association between predicted and factual RTS values

Sl	Rank Scores	Correlation Coefficient	Sig. (2-tailed)	N
1	Rank of Generic Model_Score	1.000	.	21
2	Rank of RTS_Score	.526*	.014	21

On reviewing data presented in Table 4.31, it was observed that there is a positive correlation between generic business model framework predicted RTS values and factual RTS derived data, which was statistically significant ($r_s(19) = 0.526$, $p = 0.014$).

Since there is a statistically significant association between the two rank scores, we reject the null hypothesis (H_{05}) in this case and accept the alternate hypothesis.

From the above it is clear that the predicted business performance and success metric values (RTS) have a positive correlation with factual business performance measure (RTS). Hence ranking of 33 organizations exhibiting 21 unique business models based on predicted RTS values obtained by applying the constructed business model framework under Table 5.8 clearly indicates comparison and ranking of organizations based on business performance.

In other words this test proves that there is an association between the generic model generated RTS values and factual RTS values for Indian Life Sciences BPO organizations. Hence this constructed generic business model framework can also be used to theoretically evaluate the success of a business model in the Indian Life Sciences BPO domain.

Chapter 5

Conclusions and Managerial Implications

This chapter provides conclusions of the research study and managerial implications along with limitations of this study.

Overall, this research is aimed at improving the understanding of heterogeneity in business performance among organizations in the Indian Life Sciences BPO Industry. According to Slywotzky et al., (1997), Timmers, (1998), Tapscott et al., (2000) and Kaplan et al., (2004), this difference on why some firms do better than others is explained in the form of "business models".

Based on the work on various authors such as Magretta (2002), Petrovic et al., (2001), Timmers, (1998), Weill and Vitale (2001), Osterwalder and Pigneur, (2002), Ghaziani and Ventresca (2002), Rappa (2003) to name a few, the researcher defines a business model as "an essential conceptual structure that contains a set of elements (critical success factors) and their relationships that allows expressing an organization's unique strengths required to attain business success."

Hence, understanding the relationship between business models and business performance of organizations in the Indian Life Sciences Business Processing Outsourcing (BPO) Industry would help us better understand, explain and control the heterogeneity of business performance and success of various organizations in this specific industry segment.

From literature review, it is evident that there are no industry specific models, frameworks, tools which can be applied to create organization specific business models and compare these organizations based on their business performance. On comparison we can empirically understand the relationship between business models and business performance of organizations belonging to this specific industry.

Due to the lack of models or frameworks required to create business models, this study constructs a industry specific generic business model framework which is then used to identify existing business models, study, compare relationships and predict business performance of organizations.

5.1. Conclusions

5.1.1. Elemental Critical Success Factors

In conclusion, the research study finally lead to identification of 46 elemental critical success factors and eight themes under which these 46 elemental CSF were categorized.

1. The identified 46 elemental critical success factors include : Physical Infrastructure, Technology, Support Services, Management Commitment, Organizational Effectiveness, Business flexibility, Partners / Collaborators, Corporate ethics, Availability, Employability, Skills & Attitude, Domain Knowledge, HR practices, Process Management, Quality Systems, Global Delivery Footprint, Depth of Services, Unique Positioning, Business Flexibility, Customer Relationships, Sales Force Size, Sales Force (Geographic presence), Customer Satisfaction, Investment, Access to Capital markets, Cost Structure, Revenue Stream, Cash Flow Management, Sustenance, Customer focus, Political, Economic (Internal to org), Socio cultural, Technological, Global business cycle, Regulatory, Threat of Substitute Products / Services, Threat of New Entrants, Competitive Rivalry Within Industry, Bargaining Power of Buyers, Bargaining Power of Suppliers, Bargaining Power of Complementors, Service Innovation, Operational Innovation, Marketing Innovation, Technological Innovation.

2. The eight identified themes were: Strategy (made up of 8 elemental CSF), Human Resources (5 elemental CSF), Operations (3 elemental CSF), Marketing(7 elemental CSF), Finance(7 elemental CSF), Environment(6 elemental CSF), Industry (6 elemental CSF) and Innovation (4 elemental CSF).

3. Four groups containing specific themes were identified to influence business performance in order of decreasing magnitude. These include Operation and Innovation (GROUP 1), Strategy, Human resources and Finance CSF themes (GROUP 2). Marketing and Environment theme CSF's (GROUP 3), Industry CSF (GROUP 4). Table 5.1 given below presents this along with the name of the elemental CSF which influences the identified business model theme the most.

Table 5.1- Relationship between Themes and Elemental CSF's

Sl.	Business Model Themes affecting Business Performance	Elemental CSF's affecting Business Model Themes the most
1.	Operations	Global Delivery Footprint
2.	Innovations	Technological innovation
3.	Strategy	Management commitment
4.	Human resources	Skills & Attitudes
5.	Finance	Customer Focused practices
6.	Marketing	Customer Relationship & Management
7.	Environment	Regulatory
8.	Industry	Bargaining power of buyers

4. Constituent elemental CSF which has maximum influence on the theme Operations is Global delivery competency of the organization, for Innovations it is Technological innovation, for Strategy it is Management commitment, for Human resources - Skills & Attitudes of the resources, for Finance - Customer Focused practices, for Marketing - Customer Relationship & Management, for Environment – Regulatory and for Industry it is Bargaining power of buyers respectively.

5. The elemental CSF and the themes identified are extensive as they include factors under industry view, firm/organizational view, environment factors, technology factors, marketing factors, corporate factors, finance factors and innovation factors. This study has identified and includes elemental CSF's under all categories of construct themes of business models which affect business performance as identified by various authors outlined under Section 2.4 of literature review.

To the researcher's knowledge, this is a new contribution to the literature on identifying elemental critical success factors essential in business models of Life Sciences BPO industry and attempts to provide an empirical platform to understand heterogeneity in business performance of various organizations with different business models in this specific industry. As there are no similar precedents in the literature, comparing or contrasting this with other research findings is not possible.

However, there is strong support in the literature with reference to the methodology which has been used to arrive at these results.

5.1.2. Business Model Framework Construction

The generic business model framework specific to the Life Sciences BPO Industry was constructed based on the identified elemental CSF's and their relationships influencing business performance and success.

1. The study identified a Four Factor Solution which included Customer factor (comprising 26 elemental CSF's), Organization factor (14 elemental CSF's), Industry/Sectoral factor (05 elemental CSF's), Environmental factor (01 elemental CSF). Identified factors, factor scores, elemental CSF's affecting factor names the most and factor loading of specific factors are presented in Table 5.2.

Table 5.2- Four Factor Solution – Factor names and scores

Sl.	Factors	Factor Names	Factor Scores	Elemental CSF's affecting Factor Names the most	Factor Loadings
1	F1	Customer Factor (26 elemental CSF's)	22.039	Skills & Attitude	0.993
2	F2	Organization Factor (14 elemental CSF's)	11.109	Availability of resources	0.890
3	F3	Industry/Sectoral Factor (05 elemental CSF's)	4.097	HR practices	0.939
4	F4	Environmental Factor (01 elemental CSF)	0.788	Political	0.788

2. Customer factor has maximum influence on business performance and success of an organization represented by Returns to Shareholders (RTS) followed by Organization factor, Industry/Sectoral factor and Environmental factors respectively.

3. The generic business model framework accounts for 65.10 percent of variance (adjusted R square value) with an overall significance of less than 0.0005 (p value).

4. This generic business model framework constructed with 46 elemental CSF's, clearly and quantitatively depicts business models and their influence on business performance and success of organizations operating in the Life Sciences BPO Industry.
5. This framework or tool can be used to identify and classify business models existing in the Life Sciences BPO Industry. It can also be used to study and predict cause effect relationships between business models and business performance of organizations operating in the Life Sciences BPO Industry domain.

Again, to the researcher's knowledge, this is a new contribution to the literature on constructing a generic business model framework specifically for the Life Sciences BPO Industry. This attempts to provide an empirical tool to identify, classify and predict the effect of business model components on business or organization performance.

This also confirms to research by Roquebert et al., (1996), Brush et al., (1997), McGahan et al., (1997), Chang et al., (2000), Bowman et al., (2001), Amit et al., (2001), Lubatkin et al., (2001), McNamara et al., (2003), and Vilmos et al., (2006) which proposes and confirms the view that elemental components of business models influence business performance.

5.1.3. Hypothesis Testing

Overall, five hypothesis were identified in the study and were tested to determine the independence or dependence of an organization's business performance on its business model. In conclusion this research study demonstrates that

1. Business performance of organizations operating in the Life Sciences BPO Industry domain is positively influenced by the organizations' business model. Higher the business model score for an organization, higher is its business performance, measured as Returns to Shareholders (RTS).
2. The business performance of an organization in this domain depends positively and directly on Customer Factor, Organization Factor, Industry/Sectoral Factor and Environmental Factors – the identified elemental components of organizational business models in the Life Sciences BPO Industry sector.

3. Heterogeneity in business performance among organizations in the Life Sciences BPO Industry is dependent on their organisational business models.
4. Table 5.3 below provides a summary of the Null hypothesis tested and their acceptance or rejection.

Table 5.3- Results of Hypothesis testing

Sl.	Null Hypothesis	Accepted / Rejected	p value
1	An organizations' business performance is independent of its business model.	Rejected	<0.0005
2	An organizations' business performance is independent of "Customer Factor".	Rejected	<0.0005
3	An organizations' business performance is independent of "Organization Factor".	Rejected	<0.0005
4	An organizations' business performance is independent of "Industry/Sectoral Factor".	Rejected	<0.0005
5	An organizations' business performance is independent of "Environmental Factor".	Rejected	<0.0005

Although no specific studies in this industry sector were identified during literature review, these results conform to research by Amit and Zott (2001), Chesbrough & Rosenbloom (2002), Martinez & Kennerley, (2005), Mausollf & Spence, (2008), Melkers and Willoughby, (2005), Osterwalder et al., (2005), Melone et al., (2006), which confirm that relationships exist between business models and business performance of organizations in general.

5.1.4. Comparative Study

Completion of the comparative part of the study yielded the following

1. 33 business models based on the constructed generic business model framework were identified which were specific to the Indian Life Science BPO Industry.
2. Out of these 33 business models, 21 unique, Indian Life Science BPO Industry business models were identified.
3. Organizations having a higher number of elemental CSF's embedded in their business model perform better (on comparing and ranking organizations based on the identified business models and their predicted RTS values).

4. There is a direct and positive relation between the number of elemental CSF's present in a business model of an organization and its business performance in the Indian Life Sciences BPO Industry. Lesser the number of elemental CSF's in an organization, lesser is its predicted business performance value (RTS) and hence lesser is the organization capability to succeed in this industry segment.
5. There is a positive association between the predicted RTS values (based on the generic business model framework) and the factual RTS values (based on organizational financial data) of organizations exhibiting unique business models.

These finding confirm that a positive relationship exists between business model elements and business performance which is similar to finding of Amit and Zott (2001), Chesbrough and Rosenbloom (2002) and Osterwalder et al., (2005). The research of the indicated authors was in relation to other industries, sectors, segments and not specific to Life Sciences BPO Industry.

The results of this research study confirm that there is a strong, positive association between business models and business performance. This is empirically demonstrated through an association between business model predicted RTS values and factual RTS values of organizations operating in the Indian Life Sciences BPO Industry.

To conclude, this research study meets all its objectives and answers all research questions which formed the basis for this study.

5.2. Study Limitations

The following limitations apply to this research:

1. This study confirms the existence of business model influence on business performance but does not help understand why this influence exists.
2. This study includes a maximum number non-financial and limited financial measures/factors in the generic business model framework.
3. The effects of different business model design frameworks have not been assessed in this research study.
4. This research did not attempt to investigate the effect of business models on all business performance measures. Additional business performance measures not studied in the current research could be investigated in future research.

5. There are a number of contextual factors that can influence a Business model and hence impact organizational performance (e.g., financial structure, leadership style etc.). This research did not seek to investigate all potential contextual factors. Additional factors not studied in the current research could be investigated in future research.

The above limitations provide an opportunity for further research to enhance knowledge in this area of management.

5.3. Contributions of this Research

The following contributions are envisaged from this research:

1. Better understanding of business model research, influence of business models on business performance and effect/influence of business models on business performance in Life Sciences BPO Industry.
2. Empirical identification of different and unique business models and designs.
3. Improvement in business logic representation, design and analysis of different business models.
4. Provide a roadmap for individual firms to exploit or modify their business models to improve their performance.
5. Provide an entrepreneurial tool to improve managing businesses in a rapidly moving, complex and uncertain business environment.

5.4. Practical Implications for Managers

Based on the current research findings, several practical implications can be offered to managers in organizations wishing to extract more value from their business models.

1. The results highlight the importance of changing/adapting the business model to the changing business environment in delivering positive impact on organizational performance.
2. The proposed generic business model framework can be used to predict how changes in elemental CSF's of the business models can affect business performance.

3. The proposed generic business model framework can be used as a strategic direction tool to identify and improve elements of the existing business model to improve business performance/success.

5.5. Future Research

It would be interesting to identify and understand how and what other factors other than contextual and factual factors can influence business performance.

Another area of research would be to identify another business performance parameter or factor which could provide a more comprehensive snapshot of an organizations performance.

Constructing a generic business model framework which can be used across industry sectors to predict and understand influence of business models on business performance is another direction this research can proceed to.

Although this study has established initial evidence of a reliable and valid generic business model framework for assessing business model effects on business performance and hence move it in a more positive direction, there are several areas where the current model may benefit from further testing and refinement. The following are some components which could benefit from further testing and refinement:

- Identified Elemental CSF
- Additional Performance Evaluating Metrics
- Confirmatory Factor Analysis and
- Contextual factors influencing affecting business performance and success in this industry segment.

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Global Competitiveness of Indian Life Sciences BPO Industry – An Empirical Study

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ABSTRACT:

Globalization, has dictated collaboration in addition to competition and differentiation along with low cost delivery as common drivers for business survival and growth. Competition in turn has intensified as industries and firms are stripped of their protective, entry barriers, highlighting the need for enhanced competitiveness at both enterprise and national levels.

Business is responding to this new order of "global competitiveness" by globalizing many of its activities, seeking locations where costs are lowest, where sourcing is most efficient, where labor is most productive, where skills are readily available and where market access is guaranteed.

To understand this phenomenon of "global competitiveness" in the Indian Life Sciences BPO Industry, we initially apply the "Six Forces Model" framework, derived from Porters Five Forces Model to evaluate various forces existing and affecting competition in this industry.

We next apply an adapted, competitive index measurement framework derived from "The Global Competitiveness Index: Measuring the Productive Potential of Nations" to measure and understand India's global competitiveness in the offshore, Life Sciences business process outsourcing industry environment.

INTRODUCTION:

Competitiveness is an elusive concept, (Peter, 2006) much studied by business theorists and much invoked by politicians and commentators, but frequently dismissed as irrelevant or unimportant by economists. (Krugman, 1994) famously called it a dangerous obsession in his critique of the first Clinton administration's flirtation with industrial policy. By contrast, Michael Porter of Harvard Business School has highlighted competitive advantage as the key to superior performance by firms, industries and economies as a whole, (Porter, 1990). In part, through his influence, many agencies now monitor national competitiveness, ranging from the World Economic Forum, which publishes an annual Global Competitiveness Report, to national bodies such as the U.S. Council on Competitiveness (www.compete.org).

According to its web site (http://www.weforum.org/en/about/index.htm), The World Economic Forum is an independent international organization committed to improving the state of the world by engaging leaders in partnerships to shape global, regional and industry agendas. It was incorporated as a foundation in 1971, is based in Geneva, Switzerland, and is a impartial and not-for-profit; organisation without any political, partisan or national interests.

The World Economic Forum(WEF) has been studying the competitiveness of nations for nearly three decades. Since 1979, annual Global Competitiveness Reports have examined the factors enabling national economies to achieve sustained economic growth and long-term prosperity. Over the years their reports have served as benchmarking tools for business leaders and policymakers to identify obstacles to improved competitiveness, with the goal of stimulating discussion on strategies to overcome them.

Although the concept of competitiveness is elusive, the term "globalization" can be traced back to 1944 and was popularized by Theodore Levitt, (Levitt, Theodore) a professor at the Harvard Business School although its concepts did not permeate popular consciousness until the latter half of the 1990s.

Globalisation, is defined by many authors in a variety of ways due to the varied approaches their definitions are based upon, such as economical, political, financial, technological etc., One common thread that comes out of the various definitions that

exist for globalization is that : Globalisation is primarily a economic phenomenon, involving the increasing interaction, or integration, of national economic systems all over the world through growth in international trade, investment and capital flows. The phenomenon of globalisation is also associated with a rapid increase in cross-border social, cultural and technological exchange.(Raskin, P., T. Banuri) R.J. Barry Jones, aptly suggests that globalization may simply be an intensification of the process of international interdependence, a function of the growth of competition in an international free trade system intensified by the diffusion of technology. Moreover, there is concern for cost reductions on one hand, and on the other there is need for responding to market differences.

What has globalisation done to businesses competitiveness ?

- A global market for all products has been created, leading to the creation of Global brands
- Emergence of worldwide production markets and broader access to a range of goods for consumers and organizations
- Global Structures leading to greater and more efficient way of doing business
- Development of a global telecommunications infrastructure and greater transborder data flow, using such technologies as the Internet, communication satellites, submarine fiber optic cable, and wireless telephones
- Greater freedom of movement of goods, people, services and capital
- Standardisation of logistics
- New technology niches etc.,

The above change factors have brought the reality of **"Globalization forces everyone to compete with the cheapest producers"** into stark focus thus creating the phenomenon of "Global Competitiveness".

Porter's Five Forces Industry Analysis Framework: The "five forces model" for industry analysis (Porter, 1980) is a standard tool used by both academics and practitioners when conducting strategic management studies (Alan M. Rugman and Alain Verbeke, 2000).

Michael Porter (Porter, 2004) puts forth that competition in an industry is rooted in its underlying economic structure and goes well beyond the behaviour of current competitors. He also proposes that competition in an industry depends on five basic competitive forces – Bargaining Power of suppliers, customers, Threat of new entrant, Threat of Substitutes, and Industry Rivalry (key structural features of the industry). This framework provides a structural analysis mechanism which is the fundamental step and a key building block in diagnosing industry competition in any country or in an international market.

An important extension to Porter's work is found in the work of Brandenburger and Nalebuff in the mid-1990s. Using game theory, they added the concept of complementors (also called "the 6th force" a term which was coined by Andrew Grove, former CEO of Intel), helping to explain the reasoning behind strategic alliances.

Complementors are a very visible and influencing force in the globalized, competitive arena due to their inherent nature of "synergic value addition" to the core product or services of a supplier. Its a term used to describe businesses that sell a product/s or service/s that complement the product or service of another organization by adding value to them; for example, Intel and Microsoft (Pentium processors and Windows).

Figure 1 depicts a visual representation of the "Six Forces Model".

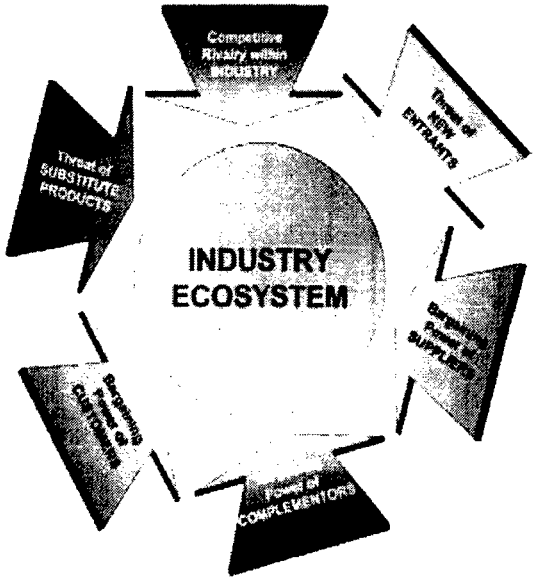

Figure 1: The "Six Forces Model"

Competitive Index Framework: The framework used to assess, measure and understand competitiveness of Indian Life Sciences BPO industry, has been adapted from the Global Competitiveness Index (GCI), which was introduced by the World Economic Forum. This is a highly comprehensive index for measuring national competitiveness, taking into account the microeconomic and macroeconomic foundations of national competitiveness. The WEF has created 12 Pillars of Competitiveness (Xavier, 2008) based on : Institutions, Infrastructure, Macroeconomic stability, Health and primary education, Higher education and training, Goods market efficiency, Labor market efficiency, Financial market sophistication, Technological readiness, Market size, Business sophistication, Innovation to evaluate national competitiveness.

We have adapted this twelve pillars global competitiveness index framework according to the requirements of the Life Sciences BPO Industry and have depicted the parameters of this framework that are to be assessed in Table 1 below. The points indicated under the column titled "PARAMETERS" in Table 1 are essential to cater to the demands of Life Sciences outsourcing from any offshore location. These parameters were identified after extensive desk research of published industry reports, publications and through informal interviews with Life Science BPO industry professionals.

Table 1: Global Competitive Index – Life Sciences BPO industry.

SL	PARAMETERS	OPTIONS
Basic requirements		
I	**Institutions**	
1	Property rights	YES / NO
2	Entrepreneurial, competitive culture	YES / NO
3	Burden of government regulation	HIGH / LOW
4	Efficiency of legal framework	HIGH / LOW
5	Transparency of government policymaking	HIGH / LOW
6	Security	YES / NO
7	Corporate ethics	YES / NO
8	Accountability	YES / NO
9	Access to capital markets	HIGH / LOW
II	**Infrastructure**	

SL	PARTICULARS	DETAILS
10	Good overall infrastructure (roads, railroad, port, air transport infrastructure, electricity supply, Telephone lines)	YES / NO
III	**Macroeconomic stability**	YES / NO
IV	**Favorable time zone differential**	YES / NO
Efficiency enhancers		
V	**Higher education and training**	
11	Primary education	GOOD / BAD
12	Quantity of education	GOOD / BAD
13	Quality of education	GOOD / BAD
14	On-the-job training	YES / NO
VI	**Labor market efficiency**	
15	Flexibility	HIGH / LOW
16	Efficient use of talent	HIGH / LOW
17	Technical and managerial talent pool	HIGH / LOW
18	English language ability	HIGH / LOW
VII	**Technological readiness**	
19	Availability of latest technologies	YES / NO
20	Firm-level technology absorption	HIGH / LOW
21	FDI and technology transfer	HIGH / LOW
VIII	**Market**	
22	Domestic market size	HIGH / LOW
23	Foreign market size	HIGH / LOW
24	Low cost services	YES / NO
Innovation and sophistication factors		
IX	**Business sophistication**	
25	Networks and supporting industries	HIGH / LOW
26	Sophistication of firms' operations and strategy	HIGH / LOW
X	**Innovation**	
27	Capacity for innovation	HIGH / LOW
28	Quality of scientific research institutions	HIGH / LOW
29	Company spending on R&D	HIGH / LOW
30	University-industry research collaboration	HIGH / LOW
31	Availability of scientists and engineers	HIGH / LOW

OBJECTIVE:

The objective of this study is to understand the phenomenon of "global competitiveness" from the Life Sciences BPO Industry context, and also evaluate India's global competitiveness in the offshore, Life Sciences business process

outsourcing industry ecosystem by applying an adapted, competitive index measurement framework.

This would help in creating a framework for evaluating competitiveness of various geographies, locations or countries from the Life Sciences BPO business process outsourcing perspective.

METHODOLOGY

There are very few Life Sciences BPO focused studies and or reports available at this point in time and hence the existence of a clear need to understand the competitive nature of the Life Sciences BPO industry. Although India is a preferred offshore destination for BPO outsourcing activities in other industry functions, the competitive suitability of India as a destination for Life Sciences BPO outsourcing activity is yet to be evaluated.

An effort is being made to survey Life Sciences BPO professionals using structured questionnaire methodology to arrive at the competitive nature of the Life Sciences BPO Industry and measure the global competitive nature of Indian Life Sciences BPO Industry.

A two sections, structured questionnaire was developed based on information collected after extensive desk study followed by review of publications, from various industry reports and through informal interviews with Life Sciences BPO professionals.

The first section was related to the Six Forces Model analysis and had questions which would help identify the existence of competitive factors and their relative influence (categorised as High, Medium and Low) in the Life Sciences BPO ecosystem.

The second section of the questionnaire contained questions which would help analysing the competitive nature of India based Life Sciences BPO industry. Depending on the nature of the question, the response to this section would be a clear Yes / No or High / Low or Good / Bad against each parameter and these responses give us an insight into the actual status of these parameters at present (Table 1). The percentage of responses which indicated that a particular parameter was either Yes /

High / Good was considered and based on the following assumptions(Table 2) these competitive factors were graded as contributing to make India Highly competitive, or as having a competitive scale of medium or low for Indian based Life Sciences BPO industry at present.

Table 2 : Scaling of Competitive Parameters

Sl.	Percentage of respondents indicating Yes / High / Good for a particular Parameter	Competitiveness Status	
1.	> = 75% --	HIGH	
2.	> = 50% to < = 75%	MEDIUM	
3.	<50%	LOW	

Although these questions were not exhaustive, these were the most commonly referred to as essential in understanding the competitive nature of the Life Sciences BPO industry and competitiveness of India as the Life Sciences BPO destination.

SAMPLE

Respondents were selected randomly from top and middle levels of Life Sciences BPO organizational hierarchy from BPO's located in Bangalore, Mumbai and Gurgoan.

DATA COLLECTION

The questionnaire was administered to respondents through e-mail. E-mail and telephonic follow-ups were used to proactively receive the responses.

A total of 35 questionnaires were sent to the respondents and only 23 responded. A total of 23 responses were analyzed. All respondents who responded to this questionnaire belonged to Life Sciences Practice / BPO departments in their respective organizations.

ANALYSIS :

The number of respondents from Bangalore were the highest and respondents from Mumbai were the least. The geographic profile/distribution of respondents who participated in this study is indicated below (Table 3 & Figure 3).

Table 3 : Geographic Profile

Sl.	Location	No. of Respondents
1	Bangalore	11
2	Gurgoan	7
3	Mumbai	5

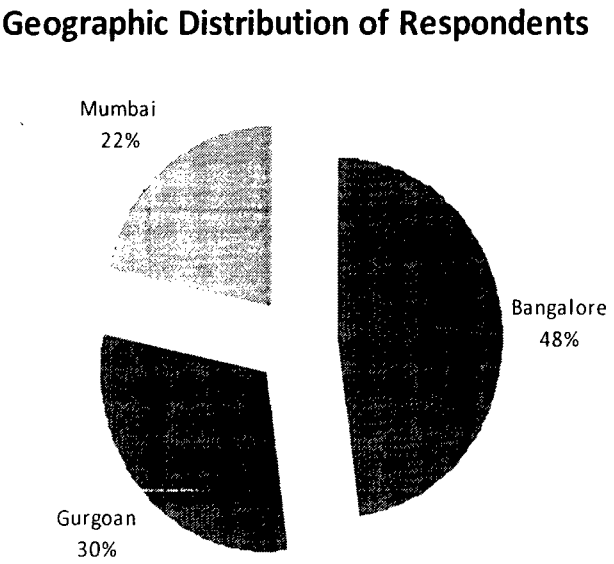

Figure 3 : Geographic Distribution of Respondents

A summary of data analyzed from the questionnaire is presented and discussed under Results and Discussions.

RESULTS AND DISCUSSION:

The concept of outsourcing was made popular in the US by EDS in the 1960s. Outsourcing seeks to bring long term benefits to companies by allowing them to focus on their core competencies while a third party supplier provides support for non-core activities such as IT and IT enabled activities. Though American service providers still dominate this sector and extensive outsourcing takes place within domestic markets, globalization has introduced the dimension of offshoring, and is resulting in a complex rethink of what can be offered to whom, from where, at what quality level, and for which activities. The market has become increasingly vibrant and many nations compete to provide offshore outsourcing.

In this quest to supply for the growing offshore outsourcing demand, US and European companies are expanding globally, with India being a primary destination. India's offshoring sector is the world's largest and fastest growing.

The main business for a BPO organisation consists of absorbing outsourced processes from a customer, breaking it down into pieces, performing each piece in the location that offers the best combination of skill, cost, quality and manageability and delivering the end result of the process most effectively and efficiently. The less than seven-year-old industry's exports are now more than a third of the exports of the over 20-year-old software industry and are on a breathtaking near 40 per cent year on year growth path. (Businessworld BPO Industry report - 2006).

Porter, M. E. (2004) defines an industry "as the group of organisations producing products that are close substitutes for each other". Based on this definition, we define the Life Sciences BPO Industry as an industry which provides Business Process Outsourcing services to the Global Pharmaceutical industry.

Pharmaceutical Industry: The challenges faced by the Pharmaceuticals industry have never been greater. Consumer demand for improved healthcare continually challenges organisations to find new and increasingly innovative therapies and delivery technologies against a background of soaring R&D and marketing costs and pressure on prices.

To complicate matters further, expiring patents are jeopardising long-term revenue streams forcing pharmaceutical organisations to find new ways to plug product gaps and maintain growth rates. A predicted slowdown in growth of prescription drugs over the next five years reflects continuing competition, a dearth of new products, regulatory tightening and pricing pressure.

In this scenario, the pharmaceutical industry is being forced to look at outsourcing as a competitive necessity and not as a corporate initiative. Since adopting outsourcing as a competitive necessity by this industry is at such a late stage, compared to say industries like Banking and Financial Services it has lost the advantages of offshoring early-on.

Moreover, there are greater opportunities that are opening up for pharmaceutical firms, particularly for those that invest heavily in R&D and bring out new molecules and can comfortably invest in foreign shores with the new patent regime in force to protect their innovating interests. Opportunities have also opened up for those firms which are the lowest cost producers of bulk drugs and generics, to expand their

operations by supplying to the major producers of pharmaceuticals around the globe and by setting businesses on major consumer markets abroad, respectively.

SIX FORCES ANALYSIS:

Industry analysis to identify important structural features of the Life Sciences BPO industry was performed by understanding effect of the six competitive forces(Bargaining power of Suppliers, Bargaining power of Buyers, Threat of substitute products, Threat of new entrants, Competitive rivalry within industry and Bargaining power of Complementors) on the industry. Out of the 23 respondents who answered the questionnaire, most of them (96%) agree that the represented factors aptly capture the competitive structure of the industry and the resultant existence and influence of these forces.

A detailed illustration/exhibition of the factors analyzed, their degree of influence and the reason for the specified amount of influence on the industry is depicted in Table 4.

Table 4 : Influence of Six Forces on the Life Sciences BPO industry.

Sl.	Porter's Six Forces affecting Life Sciences Business Process Outsourcing Industry	Exist in the Industry (Yes/No)	Influence of Forces (High / Medium/Low)	Remarks / Reasons
1.	**THREAT OF SUBSTITUTE PRODUCTS / SERVICES**			
a.	Price of substitute	Yes	Low	Move the Offshored process in-house.
b.	Quality of substitute	Yes	Low	Quality of process has to be maintained at a specified level.
c.	Switching costs to buyers	Yes	High	Bringing an outsourced process in-house is expensive.
2.	**THREAT OF NEW ENTRANTS**			
a.	Economies of scale	Yes	High	•Entrants have to come into the industry at a large scale and risk strong reaction from existing organizations. •Decline in unit costs as absolute volumes increase also exists.
b.	Customer Loyalty	Yes	High	Exists due to first mover advantage.
c.	Capital requirements	Yes	High	Along with the need to invest large financial resources, a requirement of unrecoverable up-front investment exists.
d.	Switching costs	Yes	High	Employee retraining costs, time for testing, qualifying new source, relationship building etc.,

Sl.	Porter's Six Forces affecting Life Sciences Business Process Outsourcing Industry	Exist in the Industry (Yes/No)	Influence of Forces (High / Medium/Low)	Remarks / Reasons
f.	Cost disadvantages independent of scales • Proprietary technology • Favorable access to raw materials • Learning curve • Favorable locations	Yes	High	Unit costs decline through cumulative experience - due to improvements in turnaround time, enhanced productivity, effort rationalization, geographic location etc.,
g.	Government policy	Yes	Low	
3.	**COMPETITIVE RIVALRY WITHIN INDUSTRY**			
a.	Equally balanced competitors	No	Low	Very few competitors of different sizes and strategies.
b.	Slow industry growth	Yes	Low	The Life Sciences BPO industry is still in the growth phase of its evolutionary cycle. (Emerging market).
c.	High fixed or storage costs	No	Low	Infrastructure, Resources, Technology can be redeployed. No pressure to reduce prices to fill capacity or break even.
d.	Lack of differentiation or switching costs	Yes	Medium	Employee retraining costs, domain experience, relationship building etc.,
e.	Capacity augmented in large increments	Yes	High	Economies of scale dictate that capacity should be augmented in large increments.
f.	Diverse competitors	Yes	Medium	Competitors diverse in strategies, origins and relationships exist. Strategies right for one will be wrong for others.
g.	High strategic stakes	Yes	Medium	A small number of organizations have high stakes in achieving a success in the Life Science BPO industry
h.	High exit barriers	No	High	
4.	**BARGAINING POWER OF BUYERS**			
a.	Buyer purchases large volumes relative to the seller sales	Yes	Medium	Large volume buyers are not very potent forces since investments can be redeployed.
b.	Buyer purchases are a significant portion of the buyer's total costs or functionally critical	Yes	Medium	Buyers shop for favorable price(not very price sensitive) and purchase selectively.
c.	The Service it purchases from the industry are standard or undifferentiated	No	Medium	Limited options to play one organization against the other.
d.	Face few switching costs	No	High	Employee retraining costs, time for testing, qualifying new source,

Sl.	Porter's Six Forces affecting Life Sciences Business Process Outsourcing Industry	Exist in the Industry (Yes/No)	Influence of Forces (High / Medium/Low)	Remarks / Reasons
				relationship building etc.,
e.	Service is unimportant to the quality of the buyers' products or services	Yes	High	Service critical / essential to the quality of buyers products or services.
f.	Buyer has full information	Yes	High	Deal consultants if engaged provide the required information on most of the suppliers
g.	Buyers pose a credible threat of backward integration	No	Low	Main reason for outsourcing is to bring in profit efficiencies.
5.	**BARGAINING POWER OF SUPPLIERS**			
a.	Few suppliers	Yes	Medium	The Life Sciences BPO industry is still in the growth phase of its evolutionary cycle.
b.	Not obliged to contend with other substituted Services	Yes	High	Bringing an outsourced process in-house is expensive.
c.	Industry is not an important customer of the supplier group	No	Medium	The Life Sciences BPO industry is still in the growth phase of its evolutionary cycle. (Emerging market)
d.	Suppliers Service is an important input to the buyers business	Yes	High	Service critical / essential to the buyers.
e.	The supplier groups Services are differentiated or it has built up switching costs	Yes	High	Employee retraining costs, time for testing, qualifying new source, relationship building etc.,
f.	The supplier group poses a credible threat of forward integration	No	Low	Supplier group only a non-core service provider when compared to the buyer.
6.	**BARGAINING POWER OF COMPLEMENTORS**			
a.	They have the ability to integrate forward/backward into the complement's industry	No	High	Complementors are niche groups providing help to provide only a specific part of complement's industry service more efficiently / effectively. (Usually technology solutions / products).
b.	There are few or no substitute complements	No	Low	There are various options available for the complement's industry.
c.	Buyer or supplier switching costs are high	Yes	Medium	Employee retraining costs, time for testing, qualifying new source, relationship building etc.,
d.	There is relative concentration in the complement's industry	No	Medium	The Life Sciences BPO industry is still in the growth phase of its evolutionary cycle. (Emerging market).

From the above table (Table 4) it becomes very evident that :

- Entry barriers to this industry are high and Exit barriers are low – resulting in High, Stable returns.
- Economies of scale is required to be in this market leading to heavy investments in infrastructure and human capital (raw material)
- Customer Loyalty is skewed towards the initial movers in this industry – hence dislocating them is relatively easy
- Switching costs to buyers is also high – thereby limiting buyer movement from this industry.
- Cost disadvantages independent of scales leading to addition of inherent value(IP, Competitive advantage) to an organization through experience.
- Slow industry growth – the Life Sciences BPO industry is still an emerging market as its characterized by technological uncertainty, strategic uncertainty, high initial costs leading to steep cost reduction, first time buyers and a short time horizon to develop customers and build services.
- Buyer purchases large volumes relative to the seller sales and are a significant portion of the buyer's total costs (measured as volumes, quality, functional criticality).
- Few suppliers – due to which there is an inherent limit to the negotiating power of the buyer.
- A supplier is not obliged to contend with other substituted services and hence can limit transfer of cost benefits gained through experience, economies of scale etc.,
- Suppliers Service is an important input to the buyers business – hence making the supplier an important link / partner in the buyers product / service value chain.

GLOBAL COMPETITIVENESS OF INDIAN LIFE SCIENCES BPO INDUSTRY:

With annual economic growth of around 7-8 per cent, India and China have emerged as future economic superpowers, underpinned by their prowess in 'software' and

'hardware' respectively. Though the growth in these developing economies has been impressive, detractors attribute the success of companies from these nations to lower costs only, and believe that once the cost advantage diminishes future growth would shift to companies in other low cost economies.

In general, India's national competitive advantage in the offshore outsourcing industry arises from multiple sources, such as a large and relatively low cost English speaking technical and managerial talent pool, strong education and training capability, 'self breeding' network hubs, favorable demand conditions presented by a large and growing overseas market, firm strategy, structure, and rivalry characterized by an entrepreneurial and competitive culture.

Although all these factors provide a favorable competitive advantage to generic BPO service industry, the Life Sciences BPO industry is unique in its requirement for providing BPO services. The adapted competitive index framework captures the unique competitive parameters specific to the Life Sciences BPO industry.

A detailed illustration/exhibition (Table 5) provides the competitive index parameters analyzed, respondents results on the real situation or status of these particular parameters at present, and how these results affect the competitive nature of Indian Life Sciences BPO industry.

Table 5 : Competitiveness index of Indian the Life Sciences BPO industry.

SL	PARAMETERS	OPTIONS	% YES / HIGH / GOOD	% NO / LOW / BAD	Competitiveness Status
Basic requirements					
1	Efficiency of legal framework	HIGH / LOW	100	0	HIGH
2	Corporate ethics	YES / NO	100	0	HIGH
3	Accountability	YES / NO	100	0	HIGH
4	Access to capital markets	HIGH / LOW	100	0	HIGH
5	Macroeconomic stability	YES / NO	100	0	HIGH
6	Favorable time zone differential	YES / NO	100	0	HIGH
7	Primary education	GOOD / BAD	100	0	HIGH
8	Quality of education	GOOD / BAD	100	0	HIGH
9	On-the-job training	YES / NO	100	0	HIGH
10	Efficient use of talent	HIGH / LOW	100	0	HIGH
11	English language ability	HIGH / LOW	100	0	HIGH
12	Availability of latest technologies	YES / NO	100	0	HIGH

Sl.	PARAMETERS	OPTIONS	% YES / HIGH / GOOD	% NO / LOW / BAD	Competitiveness Status
13	Firm-level technology absorption	HIGH / LOW	100	0	HIGH
14	FDI and technology transfer	HIGH / LOW	100	0	HIGH
15	Foreign market size	HIGH / LOW	100	0	HIGH
16	Low cost services	YES / NO	100	0	HIGH
17	Sophistication of firms' operations and strategy	HIGH / LOW	100	0	HIGH
18	Quality of scientific research institutions	HIGH / LOW	100	0	HIGH
19	Availability of scientists and engineers	HIGH / LOW	100	0	HIGH
20	Property rights	YES / NO	87	13	HIGH
21	Transparency of government policymaking	HIGH / LOW	87	13	HIGH
22	Security	YES / NO	87	13	HIGH
23	Flexibility	HIGH / LOW	78	22	HIGH
24	Networks and supporting industries	HIGH / LOW	78	22	HIGH
25	Technical and managerial talent pool	HIGH / LOW	74	26	MEDIUM
26	Entrepreneurial, competitive culture	YES / NO	70	30	MEDIUM
27	Burden of government regulation	HIGH / LOW	65	35	MEDIUM
28	University-industry research collaboration	HIGH / LOW	65	35	MEDIUM
29	Good overall infrastructure (roads, railroad, port, air transport infrastructure, electricity supply, Telephone lines)	YES / NO	61	39	MEDIUM
30	Quantity of education	GOOD / BAD	61	39	MEDIUM
31	Capacity for innovation	HIGH / LOW	61	39	MEDIUM
32	Company spending on R&D	HIGH / LOW	43	57	LOW
33	Domestic market size	HIGH / LOW	0	100	LOW

From the above table (Table 5) it becomes very evident that on measuring the competitiveness of Indian Life Sciences BPO industry:

- 100% of respondents have responded that 19 parameters out of the evaluated 33 parameters are in existence and hence contribute to Indian Life Science BPO's High competitiveness at present.
- Whereas another 78 to 87% of respondents are of the opinion that 5 out of the evaluated 33 parameters are in existence and hence contribute to Indian Life

Science BPO's High competitiveness at present. In total, around 24 parameters out of the evaluated 33 parameters contribute to Indian Life Sciences BPO industry competitiveness at present.

- Between 61 to 74% of respondents have indicated that there are 7 parameters out of the 33 evaluated parameters which need improvement or are not available at present and hence push the competitiveness of Indian Life Science BPO's High competitiveness to a "Medium" scale.
- Between 61 to 74% of respondents have indicated that there are 7 parameters out of the 33 evaluated parameters which need improvement or are not available at present and hence push the competitiveness of Indian Life Science BPO's competitiveness to a "Medium" scale.
- Only 43% of respondents agree that the parameter "Company spending on R&D" is "High" but a majority 57% have responded that this parameter is "Low" indicating that this parameter is either nonexistent or has a room for lot of improvement. This is one of the two parameters which reduces the competitiveness of Indian Life Science BPO's competitiveness to a "Low" scale. Considering the lifecycle of this service offering, at present this is not a very important parameter although in the very near future this would be a major differentiator for Indian Life Sciences BPO companies.
- Interestingly, 100% of respondents have indicated that the domestic market size for this kind of service offering at present is low. Since these organizations are focusing purely on global markets this factor does not have relevance at this point in time. This could change once the industry moves onto the next phases of its life cycle.

In summary, the above points indicate that the Indian Life Sciences BPO industry has a high global competitive advantage to deliver Life Sciences specific BPO services in the off shored outsourcing ecosystem.

CONCLUSION:

In conclusion, on competitive analysis of the Industry Structure, Business ecosystems and their relationship structures in the Life Science BPO industry in a globalized economy some of the features which become evident include:

- Entry barriers are high and Exit barriers are low
- Customer Loyalty is skewed towards the initial movers in this industry – hence dislocating them is relatively easy
- Buyer purchases large volumes relative to the seller sales and are a significant portion of the buyer's total costs (measured as volumes, quality, functional criticality).
- Few suppliers – due to which there is a inherent limit to the negotiating power of the buyer.
- Suppliers Service is an important input to the buyers business – hence making the supplier an important link / partner in the buyers product / service value chain.

and hence the present day industry environment exhibits and facilitates a highly sustainable, high profitability scenario for organisations in this space.

On measuring the global competitiveness of India based Life Sciences BPO organisations, the following become evident:

- Indian Life Sciences BPO industry has an overall "high" competitive advantage in 24 of the 33 different parameters measured. To name a few, the high advantages areas include Efficiency of legal framework, Corporate ethics, Accountability, Access to capital markets, Macroeconomic stability, Favorable time zone differential, Primary education, Efficient use of talent, English language ability and Availability of latest technologies.
- Two areas of improvement indicated by this study are an increased investment in R & D and creating increased domestic market potential.

In conclusion, the Life Sciences BPO industry exhibits a highly sustainable, high profitable competitive scenario and Indian Life Sciences BPO industry has a "high" global competitive advantage.

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HR CHALLENGES IN BUSINESS TRANSFORMATION OUTSOURCING

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HR CHALLENGES IN BUSINESS TRANSFORMATION OUTSOURCING

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Abstract

Globalisation is demanding that business leaders face more challenges than ever, from competitors, customers, shareholders and regulators. This is forcing businesses to rapidly transform themselves into being much more flexible, growth-oriented and customer-focused organizations in the face of competition and market pressures. Such a transformation of an organisation to become the most efficient producer can be achieved through the selective use of Strategic Business Transforming Outsourcing (BTO). This paper attempts to define Business Transformation Outsourcing (BTO) and helps in understanding the HR challenges faced by BTO organizations. Solutions to overcome some of these critical challenges have been recommended.

INTRODUCTION

Globalization as a term was coined by Levitt (1983). The literature, however, has tended to date the start of globalization to a much later date, relating it to the experience of the West. However, there is no agreement on when globalisation actually originated (Guillén, 2001). Globalisation has been defined by many authors in a variety of ways due to the varied approaches their definitions are based upon, such as economical, political, financial, technological etc., One common thread that comes out of the various definitions that exist for globalization is that globalisation is primarily a economic phenomenon, involving the increasing interaction or integration of national economic systems all over the world through growth in international trade, investment and capital flows. The phenomenon of globalisation is also associated with a rapid increase in cross-border social, cultural and technological exchange. (Raskin, 2002). Jones (1995) suggested that globalization is intensification of the process of international interdependence. It is a function of the growth of competition in an international free trade system which is intensified by the diffusion of technology.

Globalisation is characterized primarily by the overlap of social, political and economic activities across continents and intensification, of interconnectedness of trade and culture (http://www.polity.co.uk/global/globalization-oxford.asp). This is leading to a situation wherein, distant, local events which can be highly significant elsewhere will

have enormous global consequences. Due to this, the boundaries between domestic matters and global affairs are becoming increasingly blurred. A good example is the local *US Subprime Crisis* which is adversely affecting economies across the world. As explained below, Globalization progresses in the following four phases.

Phase 1: Speeding up of global interactions and processes;

Phase 2: Growing global interconnectedness, flows of trade, investment, migration and culture;

Phase 3: Overlapping of social, political and economic activities across political frontiers, regions and continents.

Phase 4: Local events becoming highly significant and have enormous global consequences.

Globalization can be thought of as the widening, intensifying, speeding up, and growing impact of world-wide interconnectedness. By conceiving of globalization in this way, it becomes possible to map empirically patterns of world-wide links and relations across all key domains of human activity, from military to the cultural (http://www.polity.co.uk/global/globalization-oxford.asp). Globalization enforces competition with the cheapest producers (Friedman, 2006). To a business leader, this means that there are more challenges than ever from stakeholders such as competitors, customers, investors and regulators. The business also needs to grow revenues, become more agile in the face of competitive and market pressures and provide customers with optimum service. One of the best ways to achieve this is through globalisation of the organisation. Achieving globalisation at the organisational level would bring in widening, intensifying, speeding up, and growing impact of world-wide interconnectedness which can be used as a competitive advantage.

Globalization from the organizational context can be achieved through either outsourcing or through *Offshoring* of business processes. These practices can in turn be implemented by the organization itself (internal) or through external vendors. Outsourcing can be defined as an organizational practice to purchase goods from or to subcontract services to an outside supplier. On the other hand, *Offshoring* can be defined as a practice of moving business processes or services to overseas so as to reduce costs (Dictionary.com). Even though international trade economists have

turned their attention to fragmentation/outsourcing only recently, the phenomenon, and terms to describe it, are not new.

Landes (1998) traced the origin of outsourcing to 13th century Europe. It stemmed from attempts to reduce guild controls in the cities, and use abundant and cheap female and child labor force available in the countryside to produce finished yarn.
Outsourcing has come into prominence only after the change management approaches of the past two decades have largely been exploited. Cost reduction and competitive positioning in the 1980s, process improvement and re-engineering in the early 1990s and enterprise resource planning, customer relationship management and web technologies of the late 1990s have all but run their course. To create value for a business in today's markets means transforming the organisation into a focused, responsive, variable and resilient business. Outsourcing can primarily be achieved through two models – (a) The Business Process Outsourcing (BPO) Model and (b) The Business Transformation Outsourcing (BTO) Model.

In a BPO relationship, some or all business processes which are normally not critical to the organisation and do not form the "Core Competency" for the organisation are outsourced to an external partner. The external partner in turn would own these processes, deliver services at agreed upon levels and add value by improving the process. At the end of the contract the external vendor would – if previously agreed upon transfer the improved process back to the customer.

With Business Transformation Outsourcing (BTO) model, an organisation can make large-scale changes that are needed to support growth, cut costs, manage risk, increase agility and develop the necessary capabilities to be competitive. In a BTO relationship, the external partner commits to continuous strategic change and operation of the client's business processes – integrating people, process transformation, the associated applications and the information technology infrastructure. In addition, the BTO team works with the client to integrate business processes back into the client organisation, thus delivering faster, more successful and enduring business transformation. These results are measured against initially agreed business outcomes and the accountability for delivering those results rests with the external partner. Since BTO organisations rely primarily on creating a transformational approach towards integrating people,

process and technology, in that order, human relations management is an integral component in the chain of building a market adaptable business. At present, the level of sophistication in skills sourcing and optimization has reached a point where lack of capability and inefficiencies in Human Resource Management (HRM) will cause roadblocks in this journey towards becoming a market adaptive organisation, in the form of a *Globalized Organisation* (Bawa & Ali, 1999).

In this study, HRM includes acquiring, developing and using people in business. It is the process of acquiring, training, developing, motivating and appraising the required number of employees to perform on organization's objectives. Maintaining efficient workforce with satisfied employees is the outcome of HRM. The primary functions of HRM are human resource planning, recruitment and selection, training and management development, performance appraisal, compensation and providing employee benefits and satisfaction (Reece & O'Grady, 1987).

OBJECTIVE

The objective of this paper is gain a deeper understanding about HR challenges being faced in Business Transformation Outsourcing and offer appropriate solutions to overcome them.

METHODOLOGY

Ten BTO organizations located in Bangalore, Chennai, Gurgaon (including Delhi) and Mumbai (including Pune) were selected for this study.

The study was conducted in three parts. The first part comprised qualitative research for identifying the HR challenges faced. A tentative list of 38 challenges in different areas of human resource management was drawn on the basis of literature survey and desk study of industry manuals, reports and websites. The tentative list of HR challenges was pruned, refined and finalized after discussions with HR experts and senior level executives. A structured questionnaire was developed to measure the relevance of each challenge (respondent's perception about the extent to which the particular challenge is being faced in his/her organisation) on a five point scale.

The second part of the study comprised quantitative research on the measurement of HR challenges identified. *Structured Questionnaire on HR Challenges in BTO*, developed as explained above was sent to 50 prospective respondents in the selected BTO organizations through E-mails. There were 22 responses, of which 20 were complete in all respects. All the respondents were from HR departments in their respective organizations. Geographic profile of respondents is furnished in Table – 1.

Table - 1: Geographic Profile of Respondents

S. No.	Location	No. of Respondents
1	Bangalore	8
2	Chennai	2
3	Gurgoan	6
4	Mumbai	4

Mean scores for each one of the 25 challenges were calculated and rank ordered. Important challenges were identified on the basis of their ranking and their means being not less than 4.

The third part of the study was also qualitative. The respondents were interviewed and desk study of published literature, company manuals, reports and websites was undertaken to identify possible solutions for handling HR challenges in BTO companies.

RESULTS

Qualitative Research on Challenges

The following 25 challenges under different dimensions of human resource management in BTO companies under study were identified. These were generally in line with the available literature on BTO

(http://www.chennaionline.com/education/Events/2005/10bpo.asp:).

(a) *Recruitment*

(i) Short gestation period (from request to completion) for recruitment
(ii) Managing recruitment of a large number of people in a very short time
(iii) Requirement needs keep changing frequently (on an hourly basis!)

(iv) Incomplete / Inaccurate requirements specifications (skills, profile, roles, etc.,)

(v) Supply versus demand gap especially for middle management and domain profiles

(vi) Considered to be *low brow*, hence difficult to attract the best talent

(vii) Poor *selection hit* ratio

(viii) Poor *selection to on-boarding* ratio

(b) *Training & Development*

(ix) No standardized pre-job training

(x) Lack of focused training and certifications

(xi) Training a large and diverse talent pool quickly

(xii) Development of soft skills and professional etiquettes

(c) *Compensation & Benefits*

(xiii) No Flexibility in Compensation & Benefits structure

(xiv) No benchmarking for Compensation and Benefits

(xv) No benchmarking for performance and HR policies

(c) *Retention*

(xvi) Routine work discipline stress

(xvii) No convincing career path

(xviii) Enhanced aspirations (educational, social)

(xix) Intra-BPO poaching

(xx) Building a results-focused team culture

(d) *Strategy*

(xxi)Dearth in level of sophistication in skills sourcing and optimization

(xxii)Shrinking base of talent in middle-level management

(xxiii) Attrition, retention and exit management

(xxiv) Producing measurable improvements in individual and team performance

(e) *Others*

(xxv) Developing Global Talent Teams.

Quantitative Research on Challenges

Table – 2 furnishes the mean and rank for each one of the challenges. Three of the challenges are most important (Rank-1): (i) No benchmarking for performance and HR policies, (ii) Enhanced aspirations (educational, social), (iii) Shrinking base of talent in middle-level management; The second ranking challenge is 'Producing measurable improvements in individual and team performance'; The third ranking challenge is 'No standardized pre-job training'; The fourth ranking challenges are (i) Short gestation period (from request to completion) for recruitment, (ii) Managing recruitment of a large number of people in a very short time, (iii) Lack of focused training and certifications, (iv) Intra-BPO poaching;

Qualitative Research on Solutions

Table – 3 lists the possible solutions identified for some of the HR challenges in BTO industries.

DISCUSSIONS

(i) 'No benchmarking for performance and HR policies' is a challenge in compensation and benefits area because BTO is a new and upcoming sector. Existing practice in BPO sector are not being perceived as adequate. New solutions for this challenge, however, needs to be worked upon.

(ii) 'Shrinking base of talent in middle-level management' (rank-1), 'Managing recruitment of a large number of people in a very short time' (rank-1), 'Enhanced aspirations (educational, social)' (rank-1), 'Short gestation period (from request to completion) for recruitment' (rank-4), and 'Intra-BPO poaching' (rank-4) are expected considering the nature of the BTO industry. BPO/BTO industry is growing at an exponential rate. There is a lot of pressure to place the required number of skilled manpower available when retention is so low and the people with the required skill set are not readily available.

(iii) 'No standardized pre-job training' (rank-3) and 'Lack of focused training and certifications' (rank-4) are also understandable for BPO/BTO industry because the nature of this industry demands that all complex processes be broken down to least complex constituent pieces and a large number of people be trained to deliver these constituent pieces seamlessly more efficiently in terms of quality and time. Since complex processes are broken down into constituent pieces without any loss in the end product / service, the outsourcing organisation needs a large number of resources to work on these least complex constituent pieces. As this delivery model does not exist anywhere, there are no trained resources, or training plans, certification plans etc., these have to be created very quickly, from scratch and have to be implemented on a large number of human resources who are recruited to staff the customer process.

CONCLUSION

The most important HR challenges identified for BTO industry in this study are related to compensation & benefits, retention, strategy, training & development, and recruitment dimensions.

LIMITATION AND RECOMMENDATION

Although there are a large number of outsourcing organizations providing business process outsourcing services, only a few of them have moved in the outsourcing value chain towards providing higher value added services following the BTO path. Hence there was difficulty in getting a larger sample from BTO industry. Future research needs to be conducted on HR challenges in BTO industry, possibly taking larger samples.

Table – 2: HR Challenges: Mean and Rank

S. No.	Challenge	Mean Score for the challenge	Rank
1	Short gestation period (from request to completion) for recruitment	4.80	4
2	Managing recruitment of a large number of people in a very short time	4.80	4
3	Requirement needs keep changing frequently (on an hourly basis!)	3.05	12
4	Incomplete / Inaccurate requirements specifications (skills, profile, roles, etc.,)	3.85	6
5	Supply versus demand gap especially for middle management and domain profiles	3.85	7
6	Considered to be *low brow*, hence difficult to attract the best talent	3.95	5
7	Poor *selection hit ratio*	2.90	14
8	Poor *selection to on-boarding* ratio	2.20	15
9	No standardized pre-job training	4.85	3
10	Lack of focused training and certifications	4.8	4
11	Training a large, diverse talent pool quickly	3.1	10
12	Development of soft skills and professional etiquettes	3.15	9
13	No Flexibility in Compensation & Benefits structure	3.25	8
14	No benchmarking for Compensation and Benefits	3.1	11
15	No benchmarking for performance and HR policies	5	1
16	Routine work discipline stress	2.9	14
17	No convincing career path	2.9	14
18	Enhanced aspirations (educational, social)	5	1
19	Intra-BPO poaching	4.8	4
20	Building a results-focused team culture	2.1	16
21	Dearth in level of sophistication in skills sourcing and optimization	3.05	12
22	Shrinking base of talent in middle-level management	5	1
23	Attrition, retention and exit management	3	13
24	Producing measurable improvements in individual and team performance	4.95	2
25	Developing Global Talent Teams	3	13

Table 3: Challenges and Proposed Solutions

S. No.	Challenges	Proposed Solutions
Recruitment		
1.	Short gestation period (from request to completion) for recruitment	• Drafting and implementing static, weekly recruitment plan for the organization. • Maintain and use active database of resumes received. • Promote internal movement between client processes. • Have a dedicated recruitment team focusing on specific client engagements.
2.	Managing recruitment of a large number of people in a very short time	• Match requirement expectations. • Have a dedicated recruitment team focusing on specific client engagements. • Maintain and use active database of resumes received. • Have an active campus recruitment program in place.
3.	Considered to be *low brow*, hence difficult to attract the best talent	• Build Corporate Brand. • Educate students at colleges and influencers through other channels. • Build industry as a brand.
Training & Development		
1.	No standardized pre-job training	• Provide specified training during induction. • Standardize basic training for the organization. • Start training programs included in the syllabus at colleges through mentors.
2.	Lack of focused training and certifications	• Provide non-profit certification programs through NASSCOM. • Build in-house domain based certification training programs. • Build in-house process based certification training programs.
Retention		
1.	Intra-BPO poaching	• Build Corporate Brand. • Create and maintain an employee friendly, convenient organizational culture. (several industry reports indicate that compensation has little or no effect on attrition) • Cross train and provide a convincing career path in the organization. • Build opportunities within the organization to enhance educational aspirations. • Build ownership towards the process.
Strategy		
1.	Shrinking base of talent in middle-level management	• Build Corporate Brand. • Educate existing employees in team management and other skills through continuing education. • Build Industry as a brand.
2.	Producing measurable improvements in individual and team performance	• Benchmark process across teams, clients and the industry. • Develop and define individual and team metrics. • Create organization and client specific *Service Level Measures* for both hard as well as soft skills. • Provide a transparent, unbiased measuring and rewarding system.

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Strategic Analysis of Life Sciences Business Process Outsourcing (BPO) Industry

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ABSTRACT :

Globalization, "flat-worldisation", has dictated collaboration in addition to competition and differentiation along with low cost delivery as common drivers for business survival and growth. To create and implement a strategy for this environment, organizations need to have a clear understanding on how to garner these created opportunities and overcome challenges.

To understand this "industry structural influences" which ultimately influences profitability for an organization, Porter's Five Forces analysis framework acts as an excellent tool for industry analysis and business strategy development. Applying a sixth component to Porter's Five Forces analysis framework provides much more rigueur required to understand "collaboration" which is predominant in this globalized environment or the flattened world.

In this study, we initially apply the value chain analysis framework along with the "Six Forces Model" to understand activities within the life sciences BPO service industry structure, so as to have an insight into the fundamental value adding components, various systems and their relationships unique to this particular industry.

To understand the opportunities and challenges arising in this industry due to globalisation, we further apply the multidimensional concept of a "Value Grid" to have a clear insight into the various value addition components, systems and their multidimensional relationships, which cannot be captured by the conventional, linear value chain analysis approach.

This approach would provide a much more thorough understanding of value adding components and their relationships affecting Strategic analysis in the Globalisation / Flatworldisation environment.

INTRODUCTION :

The term "globalization" was popularized by Theodore Levitt, (Levitt, Theodore) a professor at the Harvard Business School. Levitt has been erroneously credited with coining the term in 1983, but the word "globalization" can be traced back to 1944. The term has been used by economists since 1981, however its concepts did not permeate popular consciousness until the latter half of the 1990s.

Definition : Globalisation, is defined by many authors in a variety of ways due to the varied approaches their definitions are based upon, such as economical, political, financial, technological etc., One common thread that comes out of the various definitions that exist for globalization is that : Globalisation is primarily a economic phenomenon, involving the increasing interaction, or integration, of national economic systems all over the world through growth in international trade, investment and capital flows. The phenomenon of globalisation is also associated with a rapid increase in cross-border social, cultural and technological exchange.(Raskin, P., T. Banuri) R.J. Barry Jones, aptly suggests that globalization may simply be an intensification of the process of international interdependence, a function of the growth of competition in an international free trade system intensified by the diffusion of technology.

Characteristics of Globalisation : Globalisation is characterized primarily by the following four types of changes :

- An overlap of social, political and economic activities across political frontiers, regions and continents.
- The intensification, or the growing magnitude, of interconnectedness and flows of trade, investment, finance, migration, culture, etc.
- The growing extensity and intensity of global interconnectedness can be linked to a speeding up of global interactions and processes, as the evolution of world-wide systems of transport and communication increases the velocity of the diffusion of ideas, goods, information, capital, and people.
- The growing extensity, intensity and velocity of global interactions can be associated with their deepening impact such that the effects of distant events can be highly significant elsewhere and even the most local developments may

come to have enormous global consequences. In this sense, the boundaries between domestic matters and global affairs can become increasingly blurred.

The following visual representation (Figure 1) depicts the various phases of change and their inter-relationships responsible for levelling the round world – leading to the phenomenon called "Globalisation" – "Flatworldisation".

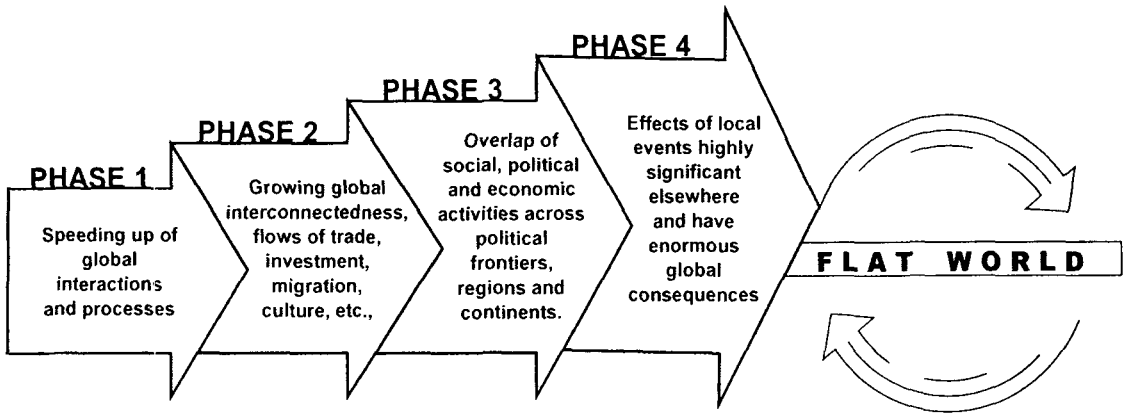

Figure 1 : Levelling the Round World

What has globalisation done to businesses globally ?

- A global market for all products has been created, leading to the creation of Global brands
- Emergence of worldwide production markets and broader access to a range of goods for consumers and organizations
- Global Structures leading to greater and more efficient way of doing business
- Development of a global telecommunications infrastructure and greater transborder data flow, using such technologies as the Internet, communication satellites, submarine fiber optic cable, and wireless telephones
- Greater freedom of movement of goods, people, services and capital
- Economical offshore production
- Virtual real time communication
- Standardisation of logistics
- New technology niches etc.,

The above change factors have brought the reality of **"Globalization forces everyone to compete with the cheapest producers"** into stark focus. What this means to a

business leader is : there are more challenges than ever from competitors, customers, shareholders and regulators. The business also needs to grow revenues, become more agile in the face of competitive and market pressures and provide customers with optimum service.

By conceiving globalization in this way, it becomes possible to map empirically patterns of world-wide links and relations across all key domains of business activity, from conceptualization to the bottom line.

Porter's Five Forces Industry Analysis Framework : The "five forces model" for industry analysis (Porter, 1980) is a standard tool used by both academics and practitioners when conducting strategic management studies (Alan M. Rugman and Alain Verbeke, 2000).

Michael Porter (Porter, 2004) puts forth that competition in an industry is rooted in its underlying economic structure and goes well beyond the behaviour of current competitors. He also proposes that competition in an industry depends on five basic competitive forces – Bargaining Power of suppliers, customers, Threat of new entrant, Threat of Substitutes, and Industry Rivalry (key structural features of the industry) which are depicted in Figure 2.

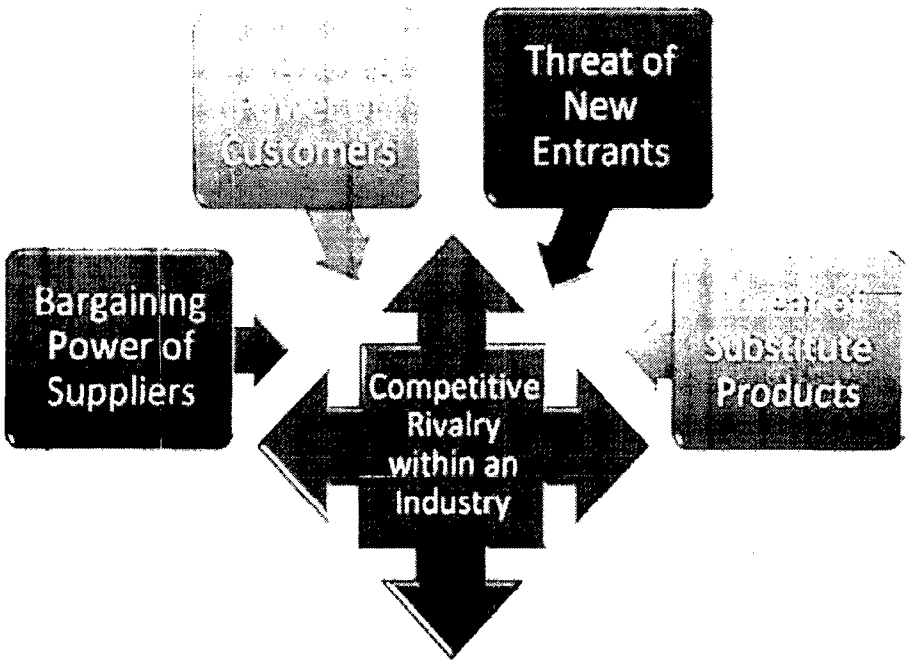

Figure 2 : Forces driving industry competition

The collective strength of these forces determines the ultimate profit potential in the industry, where profit potential is measured in terms of long run return on invested capital. This framework provides a structural analysis mechanism which is the fundamental step and a key building block in formulating a industry specific competitive strategy. This also applies in diagnosing industry competition in any country or in an international market.

An important extension to Porter's work is found in the work of Brandenburger and Nalebuff in the mid-1990s. Using game theory, they added the concept of complementors (also called "the 6th force" a term which was coined by Andrew Grove, former CEO of Intel), helping to explain the reasoning behind strategic alliances. According to most references, the sixth force is government or the public, local communities, creditors, shareholders, strategic partners and so on.

Complementors are a very visible and influencing force in the globalized, flatworldised competitive arena due to their inherent nature of "synergic value addition" to the core product or services of a supplier. Its a term used to describe businesses that sell a product/s or service/s that complement the product or service of another organization by adding value to them; for example, Intel and Microsoft (Pentium processors and Windows), or Microsoft & McAfee (Microsoft Windows & McAfee anti-virus), or Sony Play station or X-Box and game creators.

Value Chain analysis : The term 'Value Chain' was used by Michael Porter in his book "Competitive Advantage: Creating and Sustaining superior Performance" (1985). Value chain analysis describes the activities an organization performs and links them to the organizations competitive position. Therefore, it evaluates the value of each activity responsible for product / service creation of that particular industry or organisation.

Porter distinguishes between primary activities and support activities. Primary activities are directly concerned with the creation or delivery of a product or service. They can be grouped into five main areas: inbound logistics, operations, outbound logistics, marketing and sales, and service. Each of these primary activities is linked to support activities which help to improve their effectiveness or efficiency.

There are four main areas of support activities: procurement, technology development (including R&D), human resource management, and infrastructure (systems for planning, finance, quality, information management etc.).

When an the organization is able to deliver a product / service for which the customer is willing to pay more than the sum of the costs of all activities in the value chain then it earns a "margin".

Traditional value chains may have worked well for product manufacturing organisations during the last century, but in this flat world, globalized economy, innovation today comes in many shapes, sizes and often unexpectedly, especially so in a services focussed industry such as the life sciences BPO service industry. These innovations or opportunities need to be identified and garnered very early to attain and enjoy a relatively short lived competitive advantage.

Matthias and Frits(2001) tend to answer in their paper "Successful Build-to-Order Strategies Start with the Customer" the question – How holistic value chain strategies can be leveraged to enhances responsiveness to customer requirements/needs ? and thereby argue that it is essential to see value creation as multidirectional rather than linear .

Frits and Matthias, (2006) propose the notion of a "value grid" which has a multidimensional approach compared to the linear approach which the value chain analysis takes to understand the various value adding components, systems and their relationships.

This would help strategic analysts identify opportunities and challenges in the globalized life sciences BPO service industry in a faster and much more efficient way considering all the competitive, value adding dynamic factors and their multidimensional relationship structure affecting profitability of the industry.

By exploring and "mapping-out" the value grid in which life sciences BPO services are situated, we may begin to define profit-maximising strategies for the exploitation of market opportunities. Such strategies might, for example, identify and incrementally exploit a fine-grained sequence of services across the mapped out dimensions.

OBJECTIVE :

The objective of this study is to strategically analyse Industry Structure, Business ecosystems and their relationship structures in the Life Science BPO industry in a globalized economy by applying Six Forces analysis, Value chain and the Value grid frameworks and hence provide a strategic understanding of the opportunities and challenges presented therein.

This would help organisations within the life sciences BPO business ecosystem formulate strategic plans which would ultimately lead them towards positioning for value maximisation with minimization of cost.

METHODOLOGY :

The various individual factors which influence competitive forces as indicated by Porter, M. E. (2004) in his book "Competitive Strategy" were used to start this strategic analysis exercise. A questionnaire was used to collect information from 10 senior life sciences BPO managers to identify the existence of competitive factors and their relative influence (categorised as High, Medium and Low) on the life sciences BPO market. The results of this questionnaire was used to carry out the next step in the research process.

The results from the above step was used to elicit information and focus unstructured interviews and discussions with BPO industry managers . This was accompanied by desk research, customers expectations and market reality to create the value chain and value grid representations for the life sciences BPO industry.

DISCUSSION :

A study by AT Kerney in 2004 reports that nearly 90% of executives it interviewed said that they are either somewhat or very interested in offshoring. This trend has not changed very much at present since for most organizations, going offshore has moved from being a strategic advantage to a competitive necessity.

According to FSOutsourcing (June 2007), the reasons indicated for offshoring business process outsourcing are :

- Controlling costs: 35%
- Improving operational efficiency and productivity: 20%
- Accessing top-level skills: 10%
- Freeing up internal resources: 7.5%.

The IT enabling Services – BPO industry is aptly called the child of globalisation due to its very nature of conducting business. The main business for a BPO organisation consists of absorbing outsourced processes from a customer, breaking it down into pieces, performing each piece in the location that offers the best combination of skill, cost, quality and manageability and delivering the end result of the process most effectively and efficiently. The less than seven-year-old industry's exports are now more than a third of the exports of the over 20-year-old software industry and are on a breathtaking near 40 per cent year on year growth path. (Businessworld BPO Industry report - 2006).

The BPO industry started off by heavily loading itself towards the low-value voice and call centre business, commoditised and driven by severe price competition. The Indian BPO landscape is characterised by players from the following categories :

- Third party Service Providers (TPSP): Primarily Indian Businesses which provide offshore support services to global customers. (Eg : Infosys BPO, Wipro BPO, EXL Services, WNS, Genpact)
- Captive Centers (CC): Businesses which are siblings of global parents and who provide services only to their parent organisation/s. (Eg: IBM, EDS, Hewitt, Exult, Mphasis)
- Captive Centers working for Global clients other than their parent organisation/s. (Eg : IBM Dhaksh, Hewitt, Exult)
- Specialised BPO service providers (life sciences, KPO, Healthcare, Business Intelligence etc.,)

To sustain survival and growth, all businesses in this industry have started their movement up the value chain. The value game is being played particularly by the captives and also the standalone niche players and it can thus be said that the earlier slogan "Come to India for cost and stay for quality" can now be changed to "Come to India for quality and stay for innovation".

To understand the structural determinants of competitiveness in the Life Science BPO Industry, the working definition of an industry as indicated by Porter, M. E. (2004) is adapted.

He defines an industry "as the group of organisations producing products that are close substitutes for each other". Based on this definition, we define the life sciences

BPO Industry as an industry which provides Business Process Outsourcing services to the Global Pharmaceutical industry.

Pharmaceutical Industry : The challenges faced by the Pharmaceuticals industry have never been greater. Consumer demand for improved healthcare continually challenges organisations to find new and increasingly innovative therapies and delivery technologies against a background of soaring R&D and marketing costs and pressure on prices.

To complicate matters further, expiring patents are jeopardising long-term revenue streams forcing pharmaceutical organisations to find new ways to plug product gaps and maintain growth rates. A predicted slowdown in growth of prescription drugs over the next five years reflects continuing competition, a dearth of new products, regulatory tightening and pricing pressure.

Organisations presently compete to develop new blockbuster drugs and be first to market in order to obtain sufficient benefit from shorter patent lives and to recover development costs. With margins under continuous regulatory and governmental pressure, additional strategies include compressing R&D time through improved operational and management processes and the development of new technology.

In this scenario, the pharmaceutical industry is being forced to look at outsourcing as a competitive necessity and not as a corporate initiative. Since adopting outsourcing as a competitive necessity by this industry is at such a late stage, compared to say industries like Banking and Financial Services it has lost the advantages of offshoring early-on.

Emerging industries : Porter, M. E. (2004) in his book *Competitive Strategy*, defines emerging industries as newly formed or re-formed industries that have been created by technological innovations, shifts in relative cost relationships, emergence of new consumer needs, or other economic and sociological changes that elevate a new product or service to the level of potentially viable business opportunity. These exactly are changes in the business environment that were brought about by Globalisation / flatworldisation and the main reason for the creation of the life sciences BPO industry.

The life sciences BPO industry also exhibits certain essential structural characteristics identical to those exhibited by an emerging industry, such as :

- **Technological uncertainty** : A great deal of uncertainty about which technology will ultimately prove to be the best fit for a specific service configuration still exists. (Eg : Which technology platform to use to standardise procurement processes across geographies ?)
- **Strategic uncertainty** : Industry participants are still groping with various strategies, service positioning, marketing etc., and also betting on different service configuration or technologies. No one at this point in time knows who all the competitors are, and reliable industry sales and market share data are often unavailable.
- **High initial costs but steep cost reduction :** Most of the offshoring initiatives in the life sciences / Pharmaceutical domain are still in their infancy in terms of the nature of work being outsourced. This has brought in small production volumes leading to high costs along with a very steep learning curve. When gains due to learning are combined with increasing opportunities to reap economies of scale with industry growth, cost decline will be more rapid.
- **Embryonic organisations and spin-offs :** Not too many spin-offs exist in this industry although large players who are active in the traditional BPO space have started offering services to the Pharmaceutical sector.
- **First time buyers :** life sciences BPO service buyers are inherently first-time buyers.
- **Short time horizon :** There is a short time to develop customers and or build services to create and meet demand.
- **Subsidy** : Government subsidies do exist at this point in time for the BPO industry.

Due to the above reasons we can attribute the status of "emerging market" to the life sciences BPO service industry, at this point in time.

SIX FORCES ANALYSIS :

The economic structure of an industry is not an accident. Its complexities are the result of long-term social trends and economic forces. But its effects on a business manager is immediate because it determines the competitive rules and strategies for business survival and growth. Learning about that structure will provide essential insight to create a sustainable business strategy.

Together, the strength of six competitive forces (Bargaining power of Suppliers, Bargaining power of Buyers, Threat of substitute products, Threat of new entrants, Competitive rivalry within industry and Bargaining power of Complementors) determines the profit potential in an industry by influencing the prices, costs, and required investments of businesses—the elements of return on investment. Stronger forces are associated with a more challenging business environment.

Industry analysis to identify important structural features of the life sciences BPO industry was performed by understanding effect of the six competitive forces on the industry. Out of the 10 respondents who answered the questionnaire completely, most of them (96%) agree that the represented factors aptly capture the value chain of the industry. This response was used as a tool to elicit information and focus the unstructured interviews. Respondents to the unstructured interviews also had the same opinion and also agreed upon the resultant existence and influence of these forces.

A detailed illustration/exhibition of the factors analyzed, their degree of influence and the reason for the specified amount of influence on the industry is depicted in Table 1.

Table 1 : Influence of Six Forces on the life sciences BPO industry.

Sl.	Porter's Six Forces affecting life sciences Business Process Outsourcing Industry	Exist in the Industry (Yes/No)	Influence of Forces (High / Medium/Low)	Remarks / Reasons
1.	**THREAT OF SUBSTITUTE PRODUCTS / SERVICES**			
a.	Price of substitute	Yes	Low	Move the Offshored process in-house.
b.	Quality of substitute	Yes	Low	Quality of process has to be maintained at a specified level.
c.	Switching costs to buyers	Yes	High	Bringing an outsourced process in-house is expensive.
2.	**THREAT OF NEW ENTRANTS**			
a.	Economies of scale	Yes	High	•Entrants have to come into the industry at a large scale and risk strong reaction from existing organizations. •Decline in unit costs as absolute volumes increase also exists.
b.	Customer Loyalty	Yes	High	Exists due to first mover advantage.
c.	Capital requirements	Yes	High	Along with the need to invest large financial resources, a requirement of unrecoverable

Sl.	Porter's Six Forces affecting life sciences Business Process Outsourcing Industry	Exist in the Industry (Yes/No)	Influence of Forces (High / Medium/Low)	Remarks / Reasons
				up-front investment exists.
d.	Switching costs	Yes	High	Employee retraining costs, time for testing, qualifying new source, relationship building etc.,
f.	Cost disadvantages independent of scales • Proprietary technology • Favorable access to raw materials • Learning curve • Favorable locations	Yes	High	Unit costs decline through cumulative experience - due to improvements in turnaround time, enhanced productivity, effort rationalization, geographic location etc.,
g.	Government policy	Yes	Low	
3.	**COMPETITIVE RIVALRY WITHIN INDUSTRY**			
a.	Equally balanced competitors	No	Low	Very few competitors of different sizes and strategies.
b.	Slow industry growth	Yes	Low	The life sciences BPO industry is still in the growth phase of its evolutionary cycle. (Emerging market).
c.	High fixed or storage costs	No	Low	Infrastructure, Resources, Technology can be redeployed. No pressure to reduce prices to fill capacity or break even.
d.	Lack of differentiation or switching costs	Yes	Medium	Employee retraining costs, domain experience, relationship building etc.,
e.	Capacity augmented in large increments	Yes	High	Economies of scale dictate that capacity should be augmented in large increments.
f.	Diverse competitors	Yes	Medium	Competitors diverse in strategies, origins and relationships exist. Strategies right for one will be wrong for others.
g.	High strategic stakes	Yes	Medium	A small number of organizations have high stakes in achieving a success in the Life Science BPO industry
h.	High exit barriers	No	High	
4.	**BARGAINING POWER OF BUYERS**			
a.	Buyer purchases large volumes relative to the seller sales	Yes	Medium	Large volume buyers are not very potent forces since investments can be redeployed.
b.	Buyer purchases are a significant portion of the buyer's total costs	Yes	Medium	Buyers shop for favorable price(not very price sensitive) and purchase selectively.

Sl.	Porter's Six Forces affecting life sciences Business Process Outsourcing Industry	Exist in the Industry (Yes/No)	Influence of Forces (High / Medium/Low)	Remarks / Reasons
	or functionally critical			
c.	The Service it purchases from the industry are standard or undifferentiated	No	Medium	Limited options to play one organization against the other.
d.	Face few switching costs	No	High	Employee retraining costs, time for testing, qualifying new source, relationship building etc.,
e.	Service is unimportant to the quality of the buyers' products or services	Yes	High	Service critical / essential to the quality of buyers products or services.
f.	Buyer has full information	Yes	High	Deal consultants if engaged provide the required information on most of the suppliers
g.	Buyers pose a credible threat of backward integration	No	Low	Main reason for outsourcing is to bring in profit efficiencies.
5.	**BARGAINING POWER OF SUPPLIERS**			
a.	Few suppliers	Yes	Medium	The life sciences BPO industry is still in the growth phase of its evolutionary cycle.
b.	Not obliged to contend with other substituted Services	Yes	High	Bringing an outsourced process in-house is expensive.
c.	Industry is not an important customer of the supplier group	No	Medium	The life sciences BPO industry is still in the growth phase of its evolutionary cycle. (Emerging market)
d.	Suppliers Service is an important input to the buyers business	Yes	High	Service critical / essential to the buyers.
e.	The supplier groups Services are differentiated or it has built up switching costs	Yes	High	Employee retraining costs, time for testing, qualifying new source, relationship building etc.,
f.	The supplier group poses a credible threat of forward integration	No	Low	Supplier group only a non-core service provider when compared to the buyer.
6.	**BARGAINING POWER OF COMPLEMENTORS**			
a.	They have the ability to integrate forward/backward into the complement's industry	No	High	Complementors are niche groups providing help to provide only a specific part of complement's industry service more efficiently / effectively. (Usually technology solutions / products).
b.	There are few or no	No	Low	There are various options

Sl.	Porter's Six Forces affecting life sciences Business Process Outsourcing Industry	Exist in the Industry (Yes/No)	Influence of Forces (High / Medium/Low)	Remarks / Reasons
	substitute complements			available for the complement's industry.
c.	Buyer or supplier switching costs are high	Yes	Medium	Employee retraining costs, time for testing, qualifying new source, relationship building etc.,
d.	There is relative concentration in the complement's industry	No	Medium	The life sciences BPO industry is still in the growth phase of its evolutionary cycle. (Emerging market).

From the above table (Table 1) it becomes very evident that :

- Entry barriers to this industry are high and Exit barriers are low – resulting in High, Stable returns. This is due to the fact that a high entry barrier limits the number of new entrants entering this industry and a low exit barrier prevents capacity stack ups during economic downturn or other temporary windfalls. Thus providing high, stable returns.

EXIT BARRIERS

ENTRY BARRIERS		Low	High
	Low	Low, Stable Returns	Low, Risky Returns
	High	**High, Stable Returns**	High, Risky Returns

Figure 3 : Barriers and Profitability in life sciences BPO industry

- Economies of scale is required to be in this market leading to heavy investments in infrastructure and human capital (raw material)
- Customer Loyalty is squewed towards the initial movers in this industry – hence dislocating them is relatively easy
- Switching costs to buyers is also high – thereby limiting buyer movement from this industry.
- Cost disadvantages independent of scales leading to addition of inherent value(IP, Competitive advantage) to an organization through experience.
- Slow industry growth – the life sciences BPO industry is still an emerging market as its characterized by technological uncertainty, strategic uncertainty,

high initial costs leading to steep cost reduction, first time buyers and a short time horizon to develop customers and build services.

- Buyer purchases large volumes relative to the seller sales and are a significant portion of the buyer's total costs (measured as volumes, quality, functional criticality).
- Few suppliers – due to which there is a inherent limit to the negotiating power of the buyer.
- A supplier is not obliged to contend with other substituted services and hence can limit transfer of cost benefits gained through experience, economies of scale etc.,
- Suppliers Service is an important input to the buyers business – hence making the supplier an important link / partner in the buyers product / service value chain.

An overall industry structure and the position / strength of influence of the six competitive forces is summarized in Table 2.

Table 2 : life sciences BPO Industry Structure and Influence.

Sl.	Porter's Six Forces affecting life sciences Business Process Outsourcing Industry	Exist in the Industry (Yes/No)	Influence of Forces (High / Medium/Low)
1.	Threat of Substitute Products / Services	Yes	Low
2.	Threat of New Entrants	Yes	Low
3.	Competitive Rivalry Within Industry	Yes	Low to Medium
4.	Bargaining Power of Buyers	Yes	Low to Medium
5.	Bargaining Power of Suppliers	Yes	Medium to High
6.	Bargaining Power of Complementors	Yes	Low

For the life sciences BPO industry the strategic analysis can be summarized as – threat of substitutes are low, threat of new entrants is low due to high entry barriers, exit barriers are also low and competitive rivalry within the industry is also low since each of the player in this industry is still trying out various strategies and hence rules of engagement are not yet clearly defined.

Coupling this with a relatively higher bargaining power of suppliers compared to bargaining power of buyers and low bargaining power of complementors, we can conclude that, at this point in time, **the Life Science BPO industry environment exhibits and facilitates a highly sustainable, high profitability scenario** and is a

very attractive segment for incubating new businesses, creating Pharma focused industry segments or creating new profitability, business models.

VALUE CHAIN ANALYSIS :

The value chain framework is an approach for breaking down the sequence (chain) of business functions into strategically relevant activities through which utility / value is added to products and services. Value chain analysis is undertaken in order to understand the behavior of costs and the sources of differentiation (Shank & Govindarajan, 1993).

Value chain analysis can help an organisation determine which type of competitive advantage to pursue, and how to pursue it. There are two components of value chain analysis: the industry value chain and the organization's internal value chain.

Industry Value Chain : The business to Business (B2B) value chain for life sciences BPO industry consists of all physically and technologically distinct activities within the industry that add value to the buyer's experience. The key to analyzing the value chain is in understanding the activities within the industry and how they contribute to the overall experience of derived value to the buyer.

Thomas and David (2005) in their book "Concepts in Strategic Management and Business Policy", state that, the value system of each industry can be split into two segments : Upstream and Downstream. For example Oil exploration, drilling and moving the crude oil to the refinery can be considered as upstream activities whereas refining and transporting gasoline can be considered as downstream activity.

Since upstream and downstream classification is based on the fact that more value is added as a product moves from upstream to downstream towards creating a user usable form, in the life sciences BPO service industry a similar situation can be envisaged if we were to consider the type and kind of activities a supplier finally delivers to the buyer. For example capturing data from inputs into a database can be considered as upstream activity whereas providing user usable information in the form of a document / report which originates after the captured data is cleaned, analyzed and provided with an inference can be considered to be downstream.

An adapted, typical, life sciences BPO industry value chain along with individual components and a market map is depicted in Figure 4.

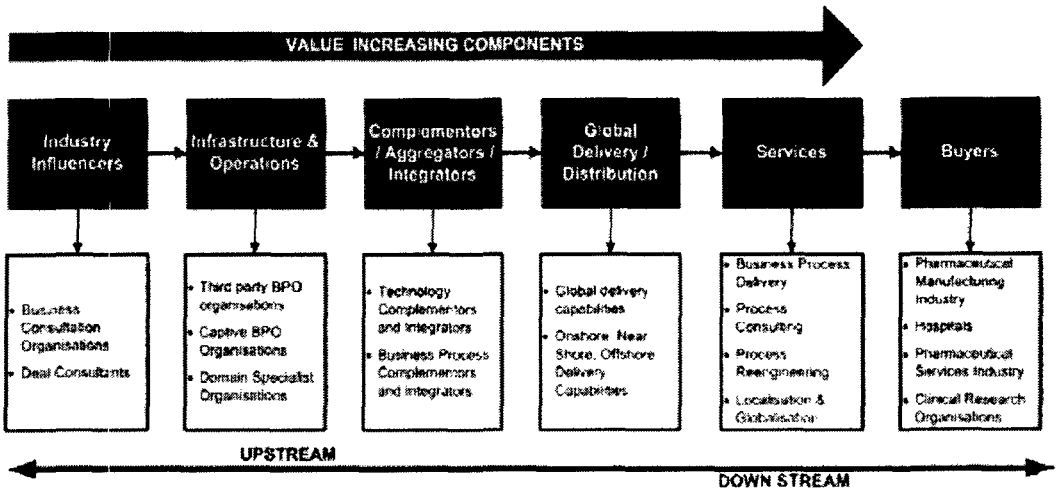

Figure 4 : life sciences BPO industry Supplier value chain and Market map.

Deal Consultants or business consultant organizations in the value chain of the life sciences BPO Industry typically provide consultation to buyers/customers and facilitate identification of processes that can be outsourced due to a valid need in the buyers organization or due to the existence of a valid business reason like improved process efficiency, helping the customer focus on his/her core activities etc. They would also facilitate in building the initial relationship between the buyer and the seller. This activity of "outsourcable process identification" is also undertaken by some BPO organizations.

In the life sciences BPO industry, the processes identified to be outsourced, would undergo a transfer of ownership – from the buyer to suppliers who have the required infrastructural and operational competencies to absorb and execute these processes – without any knowledge gaps – that were until now executed in the buyers organization. These suppliers can either be third party BPO organization/s(TPO) or buyer owner captive organization/s(CO) or very specialist, niche process executing organization – Domain specialist organizations(DSO).

In the next level of this value chain, we find organizations (TPO, CO, DSO) who have collaborated with technology and or business process complementors to bring in competencies which would result in adding more value to the processes being executed. Eg: Offering a technology solution to reduce turnaround time by automating the input stage in the process. This would lead to improved accuracy, efficiency, productivity, reduced cost etc.,

Organizations having a global footprint in terms of operational / delivery centers would have extended delivery capabilities and hence process efficiencies when compared to localized delivery center focused BPO organizations. Utilization of varied geographic specificities demanded by buyers and processes, to build efficiencies and in certain cases due to regulatory requirements of the buyer country, life sciences BPO industry with a Global delivery capability is much more attractive.

The life Sciences BPO service industry which can provide process reengineering capabilities, along with business consulting would be more attractive to the buyer than the one which does plain process execution.

The typical buyers of life sciences BPO services would be Pharmaceutical manufacturers which includes Branded medicines manufacturers, Biologics manufacturers, Medical Devices industry, Generic medicines manufacturers, Clinical research organizations, Contract research organizations, Hospitals, Diagnostics industry, Pharmaceutical chemical manufacturers (Bulk drug / API manufacturers) to name a few.

Organization's internal value chain : Porter (1985) suggested that the activities of a business can be grouped under two headings: primary activities, those that are directly involved with the physical creation and delivery of the product or service; and support activities, which feed both into primary activities and into each other. Support activities (e.g., human resource management, technology development) are not directly involved in production, but have the potential to increase effectiveness and efficiency. Figure 5 presents a generic value chain adapted for a life sciences BPO organization.

Figure 5 : life sciences BPO industry value chain and market map.

Support activities for any life sciences BPO organization consist of :

- **Organizational infrastructure :** which concern with a wide range of support systems and functions, such as finance, planning, quality control, and general senior management, along with capability to deliver customer requested services 24/7 throughout the year from multiple geographic locations. Customers also have a say in the way they would like the infrastructure for their operations designed.

- **Human resource management :** deal with those activities that concern with recruiting, developing, motivating, and rewarding the workforce of the organization. This is one of the most important activities for a life sciences BPO organization because BPO activities require human resources to execute processes outsourced.
- **Technology development :** deal with those activities concerned with managing information processing and the development and protection of "knowledge" in the organization.
- **Procurement :** deals with how resources are acquired for the organization (e.g., sourcing and negotiating with suppliers).

Primary activities for any life sciences BPO organization consist of :

- **Inbound logistics :** involves procuring and setting up hardware and software as required by the customers process. Recruiting customer specific, process specific human resources is a very critical component of this phase, since process execution is largely driven by human beings and not machines. To manage the training needs of this human resource pool, whose training needs change based on customer, process requirements, creating and maintaining a flexible learning management system along with a knowledge management system is also very critical.
- **Operations :** involve the actual process of delivering the process' end result within the agreed upon timelines and quality specifications. Managing and utilizing technology integration with the process is also essential in this industry.
- **Outbound logistics :** concerns the packaging, delivery and storage of the processes' end result in the form of reports, cleaned data, etc., This packaging and delivery of life sciences BPO services normally involves real time transaction of process at various geographic locations, integrated delivery management (process consolidation) and or real time information availability to customers.
- **Sales and Marketing :** Having multi geographic customer touch points and a very effective customer relationship management structure is also a critical element for life sciences BPO organisations to succeed.

- **Service :** providing 24/5 24/7 activity support forms one of the corner stones of service delivery requirement in this industry since globalisation has driven the industry's customers to demand for real time information to sustain their competitive advantage in their primary markets.

The linkages between primary activities and secondary activities as depicted in Figure 5, are crucial for corporate success. The linkages are flows of information, goods and services, as well as systems and processes for adjusting activities. Their importance is best illustrated with some simple examples:

Only if the Sales & Marketing function delivers sales forecasts for the next period to all other departments in time and in reliable accuracy, HR will be able to recruit, train and have resources ready to man the customer specific operations for the correct date. And only if facilities and procurement do a good job and forwards order information to inbound logistics, only then operations will be able to schedule production in a way that guarantees the delivery of products in a timely and effective manner – as pre-determined by the customer.

The ultimate focus of bringing these primary and secondary activities together in a cohesive form to bear upon the market is to, create "Margins". The term, margin implies that organizations realize a profit that depends on their ability to manage the linkages between all activities in the value chain.

In other words, the above indicated components and the linkages depicted have to be optimally balanced and focused on the target market of the life sciences BPO service industry, to attain the ability to deliver the service for which the customer is willing to pay more than the sum of the costs of all activities in the value chain (profit maximization, cost minimization).

VALUE GRID ANALYSIS :

Globalisation / flatworldisation has increased the number of factors inherently influencing the six competitive forces depicted by Porter. For example, in the non flat world, manufacturing would have been focused in one geography say the US. Whereas in the flat world, to bring in efficiencies, meet market needs, survive and grow in its markets, an organisation has to have manufacturing facilities spread across geographies. Due to this, the number of factors affecting the six competitive forces and hence the value chain itself would increase by a large factor.

Given a constant pull between opportunity and threat organisations, especially so due to globalisation / flatworldisation, will always explore opportunities for managing risks, gaining additional influence over customer demand and generating new ways to create customer value. Frits and Matthias, (2006) propose the notion of notion of a "value grid" which has its origins to the original conception of a "value chain", which is a sequence of value-enhancing activities, where raw materials are formed into components that are assembled into final products, distributed, sold and serviced.

The "value grid" extends this view, to see value creation as multidimensional rather than linear. In a value grid, the vertical dimension describes multiple tiers from primary inputs (raw materials) to end users; the horizontal dimension describes opportunities at the same tier across parallel value chains; and the diagonal dimension describes opportunities for integration between value chains in any horizontal and vertical direction.

Value grids, provide the extra degrees of freedom that allow for a subtle analysis of relationships between products or services. By exploring and "mapping-out" the value grid in which life sciences BPO services are situated, we may begin to define profit-maximising strategies for the exploitation of market opportunities. Such strategies might, for example, identify and incrementally exploit a fine-grained sequence of services across the mapped out dimensions.

Due to the above factors, an approach of applying the concept of "value grid" derived from its value chain origins, to analyse the life sciences BPO industry is very essential to attain a clear understanding of the multidimensional effect of the six competitive forces guiding, driving this globalized, emerging market opportunity. This would give us a better understanding of the industry and hence help the practitioner develop more successful profit-maximising strategies for exploiting this market opportunity, especially in this era of globalisation / flatworldisation.

Figure 6 depicts an adapted, high level, value grid for the life sciences BPO industry. The vertical dimension of the value grid, comprises the value adding components of the linear value chain and hence depicts the upstream and downstream processes. The horizontal dimension in the figure is represented by the variations or inherent factors under a specific value adding component to the value chain. End users of these services are depicted in the extreme right hand corner of the figure.

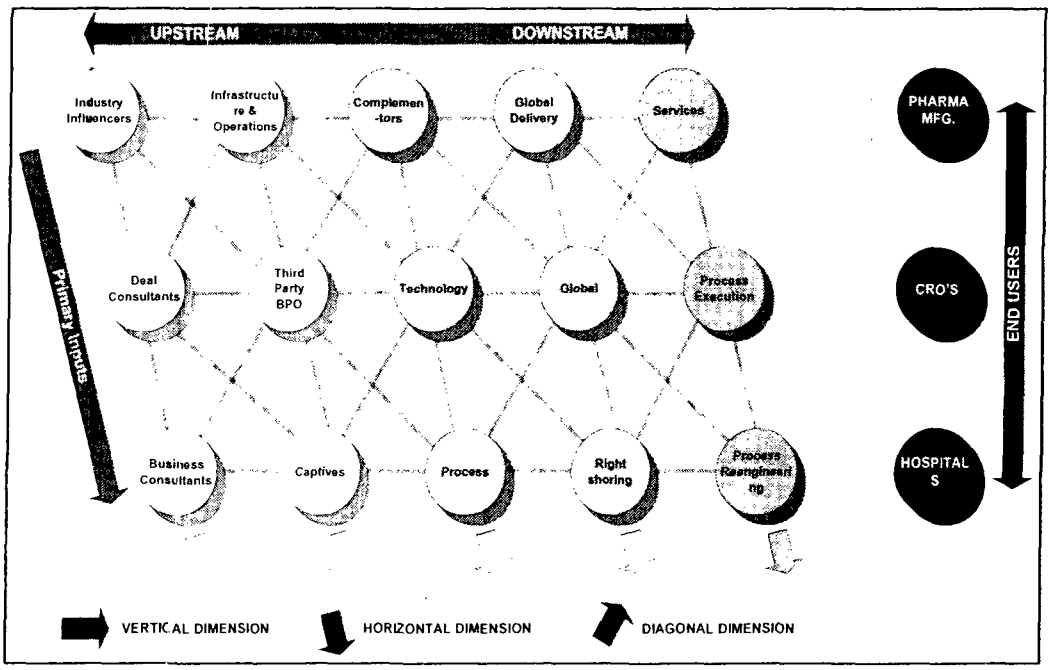

Figure 6 : Typical life sciences BPO industry value grid.

To understand the value grid lets take the following example. Under global delivery in the vertical dimension, the inherent factors which would increase or decrease value add for this value adding factor, are Global presence and Right shoring represented on the horizontal dimensional axis.

The value add to a customer is increased if service delivery can be executed through various geographies which would bring in the associated benefits of faster turn around time, reduced cost per transaction etc., On the other hand, another supplier who has global delivery centers spread in an optimal way through which he can utilise the right combination of onshore, near shore and off shore delivery centers to optimise delivery both from his point of view and the customer's point of view would have a better strategic advantage in the market.

By using the above indicated methodology and through mapping all relevant forces and their inherent influencers, every organisation can obtain a value grid very relevant to its competitive environment and hence determine an optimal strategy in a more meaningful way.

Thinking nonlinearly within the chain will help organisations in identifying :

- Opportunities to influence customer demand both upstream, downstream,

- Opportunities to explore penetration points in multiple tiers that are not immediately adjacent
- Opportunity to explore parallel value chains within the value chain's horizontal dimension
- Opportunity to explore and manage countercyclical demand pattern risks
- Opportunity to create new value propositions, integrate value creation, and pursue pinch-point(key upstream inputs for their services) mapping.

This paper has begun an exploration of a fine-grained value grid for the application of life sciences BPO Service industry. Incremental strategies are advocated, whereby all available services in a value chain are exploited in turn, and the greatest possible value is obtained from each subsequent service before we move on to the next step.

CONCLUSION :

In conclusion, on strategic analysis of the Industry Structure, Business ecosystems and their relationship structures in the Life Science BPO industry in a globalized economy the following become evident :

- The life sciences industry is an emerging market
- The present day industry environment exhibits and facilitates a highly sustainable, high profitability scenario for organisations in this space
- The industry value chain identified provides various penetration opportunities to organisations
- Optimisation of the identified primary and support service linkages in a value chain will deliver services for which a customer is willing to pay more than the sum of the costs of all activities in the value chain leading to profit maximization, cost minimization.
- Thinking multidimensionally through the value grid would help identify opportunities to influence customer demand, explore multi tier penetration points, explore parallel value chains, explore and manage countercyclical demand pattern risks and to create new value propositions, integrate value creation, and pursue pinch-point(key upstream inputs for their services) mapping.

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BUSINESS PROCESS OUTSOURCING SUPPLY CHAIN STRATEGIES FOR THE LIFE SCIENCES INDUSTRY

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ABSTRACT

Globalization, has dictated collaboration in addition to competition and differentiation along with low cost delivery as common drivers for business survival and growth. Competition in turn has intensified as industries and firms are stripped of their protective, entry barriers, highlighting the need for enhanced competitiveness at both enterprise and national levels.

Business is responding to this new order of "global competitiveness" by globalizing its supply chain both internally and externally through outsourcing many of its activities. The end objective of this strategy being - seeking locations where costs are lowest, where sourcing is most efficient, where labour is most productive, where skills are readily available and where market access is guaranteed.

To create and implement an effective, optimized supply chain outsourcing strategy for this environment, we need to have a clear understanding on how to garner these created opportunities and overcome challenges. This is especially true in the emerging Life Sciences industry outsourcing market.

Keywords: Globalisation, Life Sciences, Supply Chain, Outsourcing, Framework.

1 INTRODUCTION

The term "globalization" was coined by Theodore Levitt, in 1983 through an article he wrote in Harvard Business Review entitled "Globalization of Markets", which appeared in HBR in its May-June issue. Mullman (2006).

The literature, however, has tended to date the start of globalization more recently in the experience of the West although there is no agreement on when Globalisation actually originated. Guillén (2000).

Globalisation, is defined by many authors in a variety of ways due to the varied approaches their definitions are based upon, such as economical, political, financial, technological etc., One common thread that comes out of the various definitions that exist for globalization is that : Globalisation is primarily a economic phenomenon, involving the increasing interaction, or integration, of national economic systems all over the world through growth in international trade, investment and capital flows. The phenomenon of globalisation is also associated with a rapid increase in cross-border social, cultural and technological exchange. Raskin, (2002). Jones (1995) aptly suggests that globalization may simply be an intensification of the process of international interdependence, a function of the growth of competition in an international free trade system intensified by the diffusion of technology.

The above changes have brought the reality that **"Globalization forces everyone to compete with the cheapest producers"** Thomas Friedman (2006) into stark focus. To a business leader, this means that the business needs to grow revenues, become more agile in the face of competitive and market pressures, and, provide customers with optimum service.

Successful businesses are responding to this phenomenon of "global competitiveness" by optimizing their "business services" supply chain through outsourcing and hence attain a differentiation leading to a competitive advantage, from the business perspective. Business services in this case represents business processes essential to sustain, grow and manage a business but not core to its existence.

Outsourcing, primarily involves transferring ownership of an organization's business activities to a service provider. For a fee, the outside service provider carries out the activities and maintains responsibility for their outcomes. Chamberland, (2003).

In this paper, the focus is only on outsourcing of business processes leading to optimisation of business services supply chain in the life sciences industry. This term includes the pharmaceutical, biotechnology, medical devices and the medical diagnostic industries. Although, the framework being evolved in this paper is to create and implement an effective, optimized supply chain outsourcing strategy for the Life Sciences industry, this framework could also be applied to other segments of the biomedical industry.

1.1 Life Sciences Industry trends

Over the past decade, pharmaceutical and life sciences companies have entered a difficult period where shareholders, the market and regulators have all created significant pressures for change within the industry. From thinning pipelines and skyrocketing operating costs to calls for lower prices and a greater regulatory burden, the industry is confronting unprecedented challenges that are expected to radically transform the business.

In an atmosphere of declining research and development (R&D) productivity, mounting pricing pressure and changing regulatory requirements, global pharmaceutical and life sciences companies face increasing challenges to achieve and maintain profitable growth. PwC, (2006).

Global pharmaceutical outsourcing offers life sciences organizations an opportunity to overcome these challenges. By forming strategic relationships with outsourcing partners, companies can optimise their business services supply chain by inculcating delivery system innovation, focus on core competencies, progressing up the value chain, access specialized expertise, achieve cost-saving benefits and reduce burn rates that lead directly to greater shareholder value (by creating differentiating and hence competitiveness).

2 OBJECTIVE

The objective of this paper is to understand the various factors and their relationships affecting the process of business services supply chain outsourcing and arrive at a conceptual framework which can help organisations attain supply chain optimisation.

3 METHODOLOGY

Individual components of the framework were developed based on information collected from extensive desk study followed by review of publications, from various industry reports and through informal interviews with outsourcing professionals. Although this list is not exhaustive, these were the most commonly referred to components which were critical to attain an optimised business services supply chain.

4 DISCUSSION

Life Sciences outsourcing is presently visible as transactional operations – typically one-off, project-based deals for a specific point need – at one end and larger-scale, strategic projects, driven by an overall objective to increase value, at the other.

Outsourcing in this context can be defined to be either function-based, as in the case of IT and HR operations for example, or process-based, whereby several functions and departments are combined for example, transactional outsourcing projects are typically IT, maintenance and administration based at the functional level, and data collection, modification, monitoring and analysis based at the business process level.

However, one of the problems with transactional outsourcing is that targets are set within individual parts of the outsourced process, and although the resulting improvements may be statistically impressive at the micro level, they are often insignificant when considered across the total allocated budget. For example, a 50% cost saving at one stage of the business process, is hardly beneficial if it increases costs elsewhere, or if it is only a small part of the overall process. Not an optimised services supply chain model.

Historically, outsourcing decisions have been driven by potential cost savings, and this remains the motivating factor in the make-or-buy decision. Outsourcing operations, particularly to low-cost countries, provides cost savings from a variety of sources. Cost savings, however, also arise from cheap raw materials and reduction in overall overhead (Quint and Shorten, 2005). Additional cost savings can result from external providers' economies of scale. These sources of cost savings collectively allow the outsourcing firm to maximize its profit potential.

Beyond the potential financial rewards of outsourcing are benefits from improvements in technology and innovation. By contracting with external providers, companies are able to gain access to new technology which might otherwise not be available. Outsourcing arrangements may also create opportunities for innovation and new product development (Welch and Nayak, 1992).

Introducing an external supplier into a firm's value chain places an organisation on the fast track to innovation as it can develop synergies and learn how its processes interact with those of its outsourcing providers.

In summary, organisations that focus on those activities that drive their organization's success, and strategically outsource the rest, can further refine their skills and competencies and strengthen their competitive advantage by allowing them to focus more intensely on what the organisation is really all about.

To facilitate outsourcing decisions for organizations, and realize expected benefits from an optimised business process services supply chain, we propose the following framework. The framework presented, articulates considerations within the five primary dimensions required for creating a successful, optimised business services supply chain which incorporates outsourcing of business processes as a primary driver.

In addition, the questions, components presented in the framework are organized within six groups: who, what, when, where, why, and how much. The five primary dimensions required to arrive at an optimised supply chain model include :

- Organisations need to be very clear about the objectives of outsourcing, such as ability to focus on the core business, build business partnerships, manage fluctuating seasonal performance expectations, convert fixed cost to variable cost, process improvement etc.,
- Set clear targets for business metrics such as profitability, ROI, Department operational margins etc.,
- Set clear targets for operational excellence, process quality measurement, operational metrics, technology transformation cost savings and productivity improvements across the entire process at the outset.
- Create a active project management organization to manage the outsourcing relationship for maximum performance. For example, by assigning senior and talented executives to take responsibility for, and to drive, the outsourcing process.
- Create relationship with a partner who has a wide set of capabilities and strengths and a long-term track record of delivering results, in addition to competitive pricing and commitment to cost reductions.

Hence this framework proposes the following five distinct but overlapping dimensions : Organisational dimension; Business dimension; Operational dimension; Project management dimension; Vendor dimension; which are essential for an organization to consider for achievement of its overall outsourcing mission and goals.

Thus this framework is designed to deliver achievement of strategic, operational, financial, compliance expectations and objectives by using people, processes, assets,

and technology with a clear focus on the laws and regulations that affect the organization.

The relationship between the five dimensions on the outsourcing model are depicted in Figure 1.

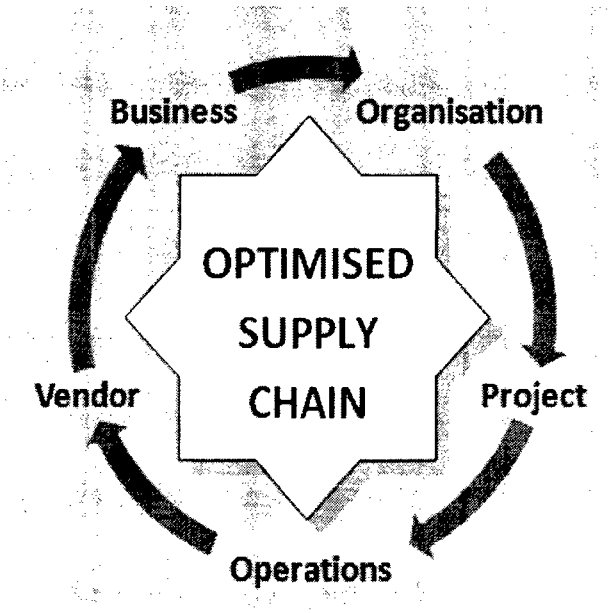

Figure 1. Relationship between the five dimensions.

The framework presented in this paper dives deeper to further outline coherent considerations within the five indicated dimensions through a series of questions to arrive at a successful strategy for outsourcing in the life sciences space. The questions presented in the framework are organized within six groups: why, what, how much, when, who, and where.

A brief description of the significance of each of the above indicated six groups, in addition to an explanation of their relative order, are given below.

Questions within the "why" category are presented first because they seek to answer the basic questions about outsourcing. Every organisation should enter into an outsourcing agreement only after addressing the fundamental issue of clearly identifying the objective of outsourcing. Answering the "why" initially also clearly identifies the nature of the outsourcing initiative – is this a strategic or a operational initiative? and therefore sets expectations within the team on what the criteria are to judge the initiative to be a success.

Analysis of the why is critical because the resulting discussion attempts to identify the main reasons the organisation is considering outsourcing. Failing to define whether its outsourcing strategy is core strategic or operational will only result in hazy objectives and ineffective measurement systems as outsourcing becomes a more critical part of the organisation's operations.

The "what" category of questions is looked at next because, after a organisation determines the objective of outsourcing, it needs to determine how to best realize the potential benefits by identifying what process or product to outsource.

The cost dimension of outsourcing should have an equal weightage since it is often the impetus for making the decision to outsource. For instance, companies hyped up about the benefits of outsourcing often fall into a copycat trap of outsourcing simply because a competitor does. With such an approach the potential outsourcer has failed to consider how customer service is integrated within the organization. When determining what to outsource, it is important that a organisation also think about whether the outsourced product or process is core or non-core. A non-core process is likely to be relatively uniform among competitors while a core process creates competitive advantage and distinguishing the organisation from others in the marketplace.

The next category is "how much", and it addresses issues like how much and of what function or process has to be outsourced to achieve objectives of the initiative.

An outsourcing strategy cannot be effectively implemented until it has been well articulated. The outsourcing agreement should provide for all the logistics contained in the arrangement, including who will do what, how will payment be exchanged, and when the transition will take place. These questions also concern how the outsourcing strategy will be determined and the outsourcing arrangement implemented, as well as how costs will be appropriately captured and measured.

The "when" category addresses the general timeframe for implementation and if the complete process is outsourced initially or an incremental approach of process outsourcing is used to outsource, amongst other things.

Outsourcing involves a significant amount of risk for all parties involved, and thus warrants adequate consideration. The crucial element in hence risk assessment, and has to takes place before any exchange of money, processes, or other resources happen. Otherwise, the outsourcing organisation has the additional risk of not fully understanding the operations of its outsourcing partner, which can lead to much larger problems upon discovery of unfavourable policies or procedures.

"Who" related questions includes the critical considerations and risks surrounding the people aspects of the outsourcing process, such as does this initiative have complete senior management support, who is making the decision, who is the outsourcing vendor, and who will remain after the transition is complete.

The final category of "where" focuses on where the outsourcing vendor will be located, associated risks, backup plan if the outsourced relationship fails etc.,

The results of this categorization, in combination with the five primary dimensions, are presented and discussed below.

All or some groups of these questions are indicated in one or more of the five dimensions as indicated in Table 1. Applying this framework towards outsourcing, by answering these questions internally and assigning a weightage to each of the questions based on their importance would help the organisation achieve a focussed approach in creating an optimised supply chain both at a micro and a macro level. Based on the weightage assigned the expectations of both the customer and the vendor are transparent and measurable a very critical factor in any organisational initiative !

Table 1. Framework components.

Framework Questions
Organisational Dimension
Why does the organisation seek to outsource ?
What does the organization seek to achieve through outsourcing ?
What does the organisation seek to outsource ?
When does the organisation think it can start the process ?

Framework Questions
How much does the organisation plan to outsource ?
Business Dimension
Does the potential outsourcing initiative have the full support of senior management ?
What does the organization seek to achieve through outsourcing ?
Are the goals of the outsourcing arrangement strategic or operational in nature?
How does the organization measure success of this outsourcing initiative ?
Has a convincing business case been developed ?
Are the goals and benefits expected to be realized from the outsourcing arrangement thoughtfully articulated?
How will the outsourcing arrangement be structured in order to get the greatest benefit without jeopardizing a organisation's strategy?
What is the estimated total cost of outsourcing? Does the outsourcing agreement truly capture all costs?
How will the continuing costs of the arrangement be managed, and are they appropriately accounted for in arriving at the initial decision to outsource?
How long will it take, from the initial stages of the outsourcing arrangement, to implementation and reach steady state through the outsourcing provider?
Operational dimension
Are the goals of the outsourcing arrangement strategic or operational in nature?
Can the process or activity to be outsourced be discretely identified?
Is the outsourced process one that provides a competitive advantage, or one that can be easily duplicated by competitors?
Has a concise outsourcing expectation, including specific process requirements and service expectations, been developed?
Are the product specifications/process descriptions available and easy to follow?
Has the potentially outsourced process been benchmarked against "best in class"?
How have information technology needs been addressed within the outsourcing agreement?
What is the sourcing organisation's intended exit strategy, and how will it minimize damage if the outsourcing arrangement sours?

Framework Questions
Is there a clear basis for measurement to determine if the outsourcing arrangement has achieved what it set out to achieve?
How will the benefits of continuous improvement and productivity gains be shared between the outsourcing provider and the sourcing organisation?
How will "lessons learned" from mistakes in the past be translated into improvements for future outsourcing relationships?
Has the organisation made express statements about what it expects to contribute in terms of time, equipment, inventory, etc.?
Project management dimension
Are the goals of the outsourcing arrangement strategic or operational in nature?
Have all relevant parties been consulted in arriving at the decision to outsource?
Has the outsourcing team been allocated adequate resources, in terms of both dollars and skills, in the process of selecting a vendor?
Has a dedicated outsourcing governance organization/relationship management team been formed to monitor and facilitate all outsourcing arrangements?
Has the full outsourcing arrangement been planned and articulated before an announcement is made to employees?
Has a concise outsourcing strategy, including specific process requirements and service expectations, been developed?
Is there a clear basis for measurement to determine if the outsourcing arrangement has achieved what it set out to achieve?
How will customer service and customer expectations be addressed within the outsourcing arrangement?
What is the sourcing organisation's intended exit strategy, and how will it minimize damage if the outsourcing arrangement sours?
What is the estimated total cost of outsourcing? Does the outsourcing agreement truly capture all costs?
Will the entire process be outsourced at once? Or will it be implemented in stages, such as handing off sourcing, then assembly?
Is the timeline for implementation of the outsourcing arrangement reasonable in light of the needs and requirements of both parties?
Vendor dimension
Has a concise outsourcing strategy, including specific process requirements and service expectations, been developed?

Framework Questions
Are the goals and benefits expected to be realized from the outsourcing arrangement thoughtfully articulated? And is the potential vendor made aware of those goals and objectives?
Has the organisation made express statements about what it expects to contribute in terms of time, equipment, inventory, etc.?
Does the outsourcing agreement provide for flexibility in terms of business requirements and needs? In particular, does it address change orders?
Will the outsourcing organisation and its providers' systems be able to effectively interface?
If outsourcing to a faraway country, how will shortages and stock outs, as well as the inevitable obsolete inventory, be handled?
Have all potential outsourcing vendors been considered, or has the organisation limited itself to "sole-source" outsourcing?
Have all potential outsourcing vendors been considered, or has the organisation limited itself to "sole-source" outsourcing?
Has a thorough and complete financial due diligence been completed on the potential outsourcing provider?
Is the culture at the outsourcing provider supportive of quality minded and ethical operations?
Does the outsource provider have the skills necessary to carry out the arrangement? If not, can these skills be easily recruited or can those skills be easily trained?
Does the outsourcing arrangement provide for employee transition plans?
Have employee communication issues, such as how to schedule meetings, evaluate performance, and escalate critical issues, been addressed?
What particular steps have been taken to improve communication within a cross-cultural environment?
In the event of an emergency, what kind of contingency/disaster recovery plan is in place?

5 CONCULSION

Outsourcing offers the potential for rewards, which can be categorised into four main categories which include : cost savings, financial flexibility, technological improvement, and strategic enhancement. These benefits can accrue as companies

shift their approach to outsourcing from that of a transactional outlook to a more strategic long-term solution – to create an optimised supply chain.

A strategic approach to outsourcing is characterized by a long-term partnership between an outsourcing organisation and its third-party vendor. In order to increase the chances of developing and maintaining a successful outsourcing model, the outsourcing customer will need to consider five primary dimensions of the outsourcing arrangement. In an effort to aid organisations, to develop and implement successful outsourcing models, we offer a framework to facilitate outsourcing organizations make the outsourcing decision with a more informed approach.

The supply chain optimising framework presented in this paper attempts to guide organisations in creating an optimal business services supply chain. It presents a series of questions which when answered and assigned a weightage, would give the outsourcing organization a starting point in their journey towards outsourcing. Answering and assigning weightage to these questions will enable the outsourcing organisation to maximize its outsourcing relationships both now and in the future and meet expectations both from the organisational as well as the vendor perspective.

In the life sciences industry, irrespective of the size of the organization, when outsourcing organizations apply this framework, it become obvious that outsourcing of Clinical Data Management, Pharmacovigilance, Regulatory Services and some specific R & D processes are open to be candidates for creating a successful outsourcing model and hence attain an optimised business services supply chain.

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Title of Paper : Strategic framework for creating a Life Sciences centric BPO Business Model.

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Strategic framework for creating a Life Sciences centric BPO Business Model

C. Omprakash; Dr. Mohd. Afaq Khan; Dr. K. S. Gupta.

ABSTRACT :

Globalization, has dictated collaboration in addition to competition and differentiation as common drivers for business survival and growth. Businesses are trying to respond to this new order of "global competitiveness" by restructuring their business models to accommodate this strategic objective by - seeking locations where sourcing is most efficient, where labor is most productive and where skills are readily available.

Globally, the Life Sciences business processing outsourcing industry is still trying to "emerge" and hence a need for this paper. To create and implement a effective, sustainable, business model for this environment, we need to clearly understand the various factors involved and their dynamics affecting the survival, and success or failure of a business.

In an effort to provide business managers a powerful tool for business modelling and strategic planning, efforts are being made to arrive at creating a strategic framework to create a life sciences centric BPO business model. By applying the concept of Critical Success Factor (CSF) analysis we understand the driving forces essential to create a sustainable BPO business model. The end objective of this model – servicing global BPO(services) demand of the life sciences industry and "to maximize value creation while minimizing costs".

INTRODUCTION :

Organizations, both for-profit and not-for-profit primarily exist to serve its stakeholders—customers, employees, business partners, shareholders, and communities that benefit from its existence and growth. The organization's mission embodies this focus by stating the organization's purpose, vision, and values. Stakeholders are best served when an organization operates in a manner that ensures the mission is accomplished.

To successfully accomplish the mission in a logical and systematic way requires the organization to develop a strategy. The strategy encompasses a set of goals or targets that the organization must achieve within a specific period of time. These goals are transformed into lower level tactical plans and activities to be carried out at various levels throughout the organization. This process of strategic planning provides a means for ensuring that the entire organization is focused on a shared purpose and vision to attain its mission and hence an organization's existence.

However, setting goals and developing plans to achieve them is only one factor in accomplishing the organization's mission. The organization must also perform well in a few key areas that are unique to its mission and to the industry in which it operates. In fact, failure to perform well in these areas may be a major barrier to achieving goals. These key areas can be described as a set of critical success factors—the limited number of areas in which satisfactory results will ensure competitive performance for the organization and enable it to achieve its mission (Rockhart, 1979).

Michael Porter of Harvard Business School has highlighted competitive advantage as the key to superior performance by firms, industries and economies as a whole, (Porter, 1990) but according to Peter, 2006, Competitiveness is an elusive concept.

Although the concept of competitiveness is elusive, the term "globalization" can be traced back to 1944 and was popularized by Theodore Levitt, (Levitt, Theodore 1983) a professor at the Harvard Business School although its concepts did not permeate popular consciousness until the latter half of the 1990s.

Even though globalisation, is defined by many authors in a variety of ways due to the varied approaches, one common thread that comes out of these various definitions is

that : Globalisation is primarily a economic phenomenon, involving the increasing interaction, or integration, of national economic systems all over the world through growth in international trade, investment and capital flows.

The phenomenon of globalisation is also associated with a rapid increase in cross-border social, cultural and technological exchange (Raskin, P., et al., 2002). R. J. Barry Jones (1995), aptly suggests that globalization may simply be an intensification of the process of international interdependence, a function of the growth of competition in an international free trade system intensified by the diffusion of technology.

In summary, all these point to the fact that globalisation of an organisation can help it to become more competitive as the concern for cost reductions on one hand, and the need for responding to market differences on the other are optimally balanced. This has created an environment where **"Globalization forces everyone to compete with the cheapest producers"** leading to the creation of the phenomenon which can be called "Global Competitiveness".

To assess the industry and market landscape in this "**globalized competitive business landscape**" and arrive at an organization specific strategy, business managers today are faced with an increasingly complex world, and hence need access to information which is pertinent to their organization's mission and hence their existence. One method of determining precisely what information is most needed is the "Critical Success Factors" (CSF) method. Introduced in a Harvard Business Review article entitled "Chief Executives Define Their Own Data Needs" (Rockhart, 1979), the CSF method is now being utilized in a growing number of organizations.

Critical success factor analysis : Critical success factors (CSFs) define key areas of performance that are essential for the organization to accomplish its mission. Business managers should implicitly know and consider these key areas when they set goals and as they direct operational activities and tasks that are important to achieving goals. Thus, any activity or initiative that the organization undertakes must ensure consistently high performance in these key areas; otherwise, the organization may not be able to achieve its goals and consequently may fail to accomplish its mission.

The concept of identifying and applying CSFs to business problems is not a revolutionary new field of work. It dates back to the original concept of "success factors" put forth in management literature by D. Ronald Daniel in the 1960s. However, the CSF concepts and approach are still very powerful today and are applicable to many of the business challenges being presented. The CSF method has found its way into many formalized information or business systems and technology planning methodologies that are still being used today (Richard, 2004).

James Dobbins and Richard Donnelly (Dobbins 1998) identify uses of CSFs. CSF's have been used to : identify the key concerns of senior management; assist in the development of strategic plans; identify key focus areas in each stage of a project life cycle and the major causes of project failure; evaluate the reliability of an information system; identify business threats and opportunities; measure the productivity of people to name a few applications of this method. In this context, CSFs are more than just guiding principles; instead, they are considered to be an important component of a strategic plan that must be achieved in addition to the organization's goals and objectives.

Rockhart defined five specific sources or types of CSFs for the organization as follows:
(Rockhart 1981)

- The industry in which the organization competes or exists
- An understanding of the organization's peers
- The general business climate or organizational environment
- Problems, barriers, or challenges to the organization
- Layers of management

To provide an accurate picture of an organization's overall key performance areas, it is important to identify CSFs from each of these sources. However, it was found that deriving CSFs at the highest levels of the organization tends to bring an acceptable mix of CSFs from many of these sources, as long as a broad cross section of management was represented in the process (Richard, 2004).

We have used this method of CRF identification and analysis to arrive at a strategic framework which can be used for creating a life sciences centric BPO business model or for assessing and restrategising existing life sciences centric BPO business models.

We have adapted this method of CSF identification and applied to the requirements of the Life Sciences BPO Industry and have depicted the parameters of this framework that are to be assessed in Table I below.

The parameters under the column titled "CRITICAL SUCCESS FACTORS" included in the "framework questionnaire" depicted as Table I, were identified after extensive desk research of published industry reports, publications and through informal interviews with Life Science BPO industry professionals.

Table I : Critical Success Factors – Life Sciences BPO industry.

Sl.	**CRITICAL SUCCESS FACTORS** (Industry; Competitive; Environment, Temporal)	**ESSENTIAL CSF's** (Yes / No)	**MEASURE OF ESSENTIALITY** (High / Medium / Low)
I	**INDUSTRY**		
1	Physical infrastructure (includes technology)	YES / NO	HIGH/MEDIUM/LOW
2	Human resources	YES / NO	HIGH/MEDIUM/LOW
3	Quality systems	YES / NO	HIGH/MEDIUM/LOW
4	Process management	YES / NO	HIGH/MEDIUM/LOW
5	Unique positioning advantage	YES / NO	HIGH/MEDIUM/LOW
6	Support systems	YES / NO	HIGH/MEDIUM/LOW
7	Business development	YES / NO	HIGH/MEDIUM/LOW
8	Domain / Specialized Knowledge	YES / NO	HIGH/MEDIUM/LOW
9	Depth of services	YES / NO	HIGH/MEDIUM/LOW
II	**COMPETITIVE POSITION**		
10	Threat of Substitute Products / Services	YES / NO	HIGH/MEDIUM/LOW
11	Threat of New Entrants	YES / NO	HIGH/MEDIUM/LOW
12	Competitive Rivalry Within Industry	YES / NO	HIGH/MEDIUM/LOW
13	Bargaining Power of Buyers	YES / NO	HIGH/MEDIUM/LOW
14	Bargaining Power of Suppliers	YES / NO	HIGH/MEDIUM/LOW
15	Bargaining Power of Complementors	YES / NO	HIGH/MEDIUM/LOW
16	Learning organizations	YES / NO	HIGH/MEDIUM/LOW
III	**ENVIRONMENT**		
17	Political	YES / NO	HIGH/MEDIUM/LOW
18	Economic (Internal to the organization)	YES / NO	HIGH/MEDIUM/LOW
19	Socio cultural	YES / NO	HIGH/MEDIUM/LOW
20	Technological	YES / NO	HIGH/MEDIUM/LOW

Sl.	CRITICAL SUCCESS FACTORS (Industry; Competitive; Environment, Temporal)	ESSENTIAL CSF's (Yes / No)	MEASURE OF ESSENTIALITY (High / Medium / Low)
21	Global business cycle	YES / NO	HIGH/MEDIUM/LOW
22	Regulatory	YES / NO	HIGH/MEDIUM/LOW
IV	TEMPORAL		
23	Business flexibility	YES / NO	HIGH/MEDIUM/LOW
24	Efficient use of talent	YES / NO	HIGH/MEDIUM/LOW
25	Technical and managerial talent pool	YES / NO	HIGH/MEDIUM/LOW
26	Effective change management	YES / NO	HIGH/MEDIUM/LOW
27	Rapid ramp-up and ramp-down capability	YES / NO	HIGH/MEDIUM/LOW
28	Innovative response to customer needs	YES / NO	HIGH/MEDIUM/LOW
29	Aggressive commitment when required	YES / NO	HIGH/MEDIUM/LOW
30	Customer service and feedback	YES / NO	HIGH/MEDIUM/LOW
31	Quick decision and action capability	YES / NO	HIGH/MEDIUM/LOW
32	Organizational effectiveness	YES / NO	HIGH/MEDIUM/LOW

OBJECTIVE :

The objective of this study is to understand the life sciences industry and the phenomenon of "global competitiveness" from the Life Sciences BPO Industry context, identify and evaluate "Critical Success Factors" which are strategically essential to create and sustain a offshore centric Life Sciences BPO business model.

Applying this created strategic framework would help business managers create their own competitive advantage in the offshore, Life Sciences business process outsourcing industry ecosystem.

This strategic framework can also be used as a tool to measure, and provide strategic direction to existing offshore (India) Life Science specific Business Process Outsourcing organisations.

METHODOLOGY

There are very few Life Sciences BPO focused studies and or reports available at this point in time and hence the existence of a clear need to identify and understand the Critical Success Factors essential to create and sustain an offshore specific Life Sciences BPO business model.

An effort is being made to survey Life Sciences BPO professionals using the structured questionnaire methodology to arrive at a strategic framework for creating a life sciences specific BPO business model and also measure the essentiality of these

identified critical success factors from the Life Sciences BPO Industry and Business context.

A two sections, structured questionnaire(Table I) was developed based on information collected after extensive desk study followed by review of publications, from various industry reports and through informal interviews with Life Sciences BPO professionals.

The first section was related to identifying Critical Success Factors and had parameters which would help identify the essentiality of CSF's (categorised as Yes / No) in the Life Sciences BPO ecosystem.

The second section of the questionnaire contained questions which would help measure the essentiality of identified CSF's for offshore based Life Sciences BPO business models. Depending on the nature of the question, the response to this section would be a clear High / Medium / Low against each parameter and these responses give us an insight into the importance of these parameters (Table I) in creating this strategic framework.

Although these questions were not exhaustive, these were the most commonly referred to as essential for creating a offshore centric life sciences centric BPO business models.

SAMPLE

Respondents were selected randomly from top and middle levels of Life Sciences BPO organizational hierarchy from BPO's located in Bangalore, Mumbai, Gurgoan and Chennai.

DATA COLLECTION

The questionnaire was administered to respondents through e-mail and telephonic interview methods. E-mail and telephonic follow-ups were used to proactively receive the responses.

A total of 45 questionnaires were sent/administered to the respondents and only 29 responded. A total of 26 responses were analyzed and three were rejected due to incomplete responses and lost to follow-up. All respondents who responded to this

questionnaire belonged to Life Sciences Practice / BPO departments in their respective organizations.

ANALYSIS :

The number of respondents from Bangalore were the highest and respondents from Gurgoan were the least. The geographic profile/distribution of respondents who participated in this study is indicated below (Table II & Figure I).

Table II : Geographic profile of respondents

Sl.	Location	No. of Respondents
1	Bangalore	9
2	Gurgoan	4
3	Chennai	6
4	Mumbai (incld Pune)	7

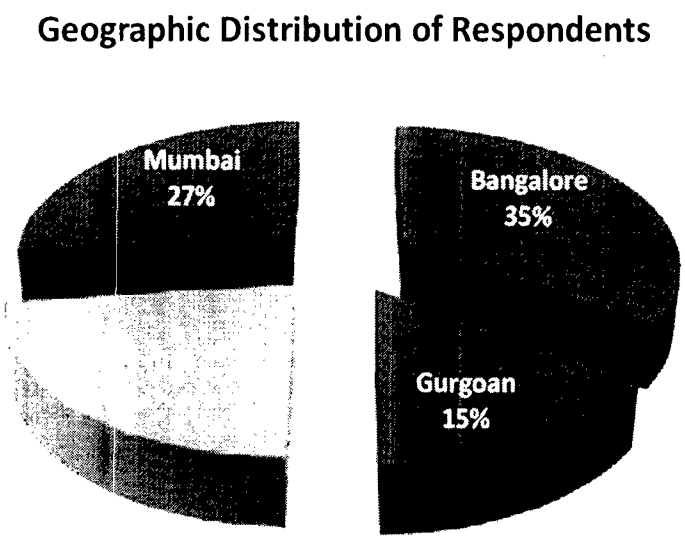

Figure I : Geographic Distribution of Respondents

A summary of data analyzed from the questionnaire is presented and discussed under Results and Discussions.

RESULTS AND DISCUSSION :

Outsourcing seeks to bring long term benefits to companies by allowing them to focus on their core competencies while a third party supplier provides support for non-core activities such as IT and IT enabled activities.

The main business for a BPO organisation consists of absorbing outsourced processes from a customer, breaking it down into pieces, performing each piece in the location

that offers the best combination of skill, cost, quality and manageability and delivering the end result of the process most effectively and efficiently. The less than seven-year-old industry's exports are now more than a third of the exports of the over 20-year-old software industry and are on a breathtaking near 40 per cent year on year growth path. (Businessworld BPO Industry report - 2006).

Porter, M. E. (2004) defines an industry "as the group of organisations producing products that are close substitutes for each other". Based on this definition, we define the Life Sciences BPO Industry as an industry which provides Business Process Outsourcing services to the Global Pharmaceutical industry.

Pharmaceutical Industry : The challenges faced by the Pharmaceuticals industry have never been greater. Consumer demand for improved healthcare continually challenges organisations to find new and increasingly innovative therapies and delivery technologies against a background of soaring R&D and marketing costs and pressure on prices. To complicate matters further, expiring patents are jeopardising long-term revenue streams forcing pharmaceutical organisations to find new ways to plug product gaps and maintain growth rates.

In this scenario, the pharmaceutical industry is being forced to look at outsourcing as a competitive necessity and not as a corporate initiative. Since adopting outsourcing as a competitive necessity by this industry is at such a late stage, compared to say industries like Banking and Financial Services it has lost the advantages of offshoring early-on.

Indian Life Sciences BPO Industry: With annual economic growth of around 7-8 per cent, India and China have emerged as future economic superpowers, underpinned by their prowess in 'software' and 'hardware' respectively. In general, India's national competitive advantage in the offshore outsourcing industry arises from multiple sources, such as a large and relatively low cost English speaking technical and managerial talent pool, strong education and training capability, 'self breeding' network hubs, favorable demand conditions presented by a large and growing overseas market, firm strategy, structure, and rivalry characterized by an entrepreneurial and competitive culture.

Although all these factors provide a favorable competitive advantage to generic BPO service industry, the Life Sciences BPO industry is unique in its requirement for providing BPO services. This paper will identify and examine the strategically Critical Success Factors required for the Life Sciences BPO industry to create a successful business model.

Critical Success Factor Analysis :

Received, completed questionnaires were scrutinized for completeness and data were captured onto an excel sheet. Total number of respondents marking Yes or No for a particular parameter were counted separately for each and every parameter. The totaled number of "Yes" or "No" responses for a particular parameter were also counted and totaled separately. Only when more than 50% of total respondents indicated the responses to be "Yes" for a particular parameter, that parameter was considered to be essential.

The categorization of High / Medium / Low by respondents for essentiality measure, were also counted and totaled separately. Again, the same principle of considering the categorization based on more than 50% response number was used. If more than 50% of the respondents indicated that they considered the essentiality of a parameter was "High" then, the measure of essentiality was categorized as "High".

For example : As exhibited under Table III, a majority(96%) of respondents had categorized("Yes") the Physical infrastructure parameter as a Critical Success Factor and had also indicated(92%) that the essentiality of this parameter was "High". Hence in Table III under column Critical Success Factor Sl. No. 1, we observe "Yes" under column "Essential CSF" and "High" under column "Measure of Essentiality".

A detailed illustration/exhibition of Critical Success Factors identified and analyzed for essentiality is depicted in Table III.

Table III : Identification and measure of essentiality of Critical Success Factors

Sl.	Critical Success Factors	Source of CSF	Essential CSF's (Yes/No)	Measure of Essentiality (High / Medium / Low)
1.	Physical infrastructure (includes technology)	INDUSTRY	Yes	High
2.	Human resources	INDUSTRY	Yes	High
3.	Quality systems	INDUSTRY	Yes	High
4.	Process management	INDUSTRY	Yes	High
5.	Unique positioning advantage	INDUSTRY	Yes	Medium
6.	Support systems	INDUSTRY	Yes	Medium
7.	Business development	INDUSTRY	Yes	High
8.	Domain / Specialized Knowledge	INDUSTRY	Yes	High
9.	Depth of services	INDUSTRY	Yes	Medium
10.	Threat of Substitute Products / Services	COMPETITIVE	Yes	Low
11.	Threat of New Entrants	COMPETITIVE	Yes	Medium
12.	Competitive Rivalry Within Industry	COMPETITIVE	Yes	Low
13.	Bargaining Power of Buyers	COMPETITIVE	Yes	Low
14.	Bargaining Power of Suppliers	COMPETITIVE	Yes	Medium
15.	Bargaining Power of Complementors	COMPETITIVE	Yes	Low
16.	Learning organizations	COMPETITIVE	Yes	High
17.	Political	ENVIRONMENT	Yes	Medium
18.	Economic (Internal to the organization)	ENVIRONMENT	Yes	High
19.	Socio cultural	ENVIRONMENT	Yes	Low
20.	Technological	ENVIRONMENT	Yes	Medium
21.	Global business cycle	ENVIRONMENT	Yes	High
22.	Regulatory	ENVIRONMENT	Yes	Medium
23.	Business flexibility	TEMPORAL	Yes	High
24.	Efficient use of talent	TEMPORAL	Yes	Medium
25.	Technical and managerial talent pool	TEMPORAL	Yes	High

Sl.	Critical Success Factors	Source of CSF	Essential CSF's (Yes/No)	Measure of Essentiality (High / Medium / Low)
26.	Effective change management	TEMPORAL	Yes	High
27.	Rapid ramp-up and ramp-down capability	TEMPORAL	Yes	Medium
28.	Innovative response to customer needs	TEMPORAL	Yes	High
29.	Aggressive commitment when required	TEMPORAL	Yes	High
30.	Customer service and feedback	TEMPORAL	Yes	High
31.	Quick decision and action capability	TEMPORAL	Yes	High
32.	Organizational effectiveness	TEMPORAL	Yes	High

From the above table (Table III) it becomes very evident that :

- A total of Thirty two Critical Success Factors were identified across the four areas of Industry, Competitive, Environment and Temporal sources by twenty six respondents. According to their responses these were considered essential to create a life sciences centric BPO business model. The measure of essentiality varied from High, Medium to Low. These identified CSF's along with their measures of essentiality when taken together will form the strategic framework for creating a Life Sciences centric BPO business model.
- Nine parameters were identified as Critical Success Factors from the industry perspective. Out of these six were considered to be highly essential and remaining three parameters were considered to be "medium" essential by respondents. The CSF's identified, define the Life Sciences BPO specific (industry specific) set of characteristics.
- In the competitive CSF's area, seven CSF's were identified by respondents. Out of this one was categorized as Highly essential whereas two and four parameters (CSF's) were categorized as having Medium and Low essentiality respectively. This source of CSF describes the current competitive nature existing in the marketplace and gives a direction to an organization to define the position that it wants to create in the marketplace or to adopt strategy to gain market share.

- In the environment source of CSF's category, a total of six CSF's were identified as essential and the measures of essentiality indicated two to be highly essential, three to be of Medium essentiality and one parameter to be of Low essentiality. This source indicates the effect of the external environment on this particular industry segment.
- Temporal factors/sources are temporary or one-off CSF's resulting from a specific event necessitating their inclusion. A total of ten CSF's were identified out of which eight were considered to be Highly essential and two were considered to be of Medium essentiality. This was in according to one of our previous studies (C. Omprakash et.al 2008) where Life Sciences customers wanted to shift their outsourcing approach to strategic long-term association from a transactional approach – so as to create an optimised supply chain. The identified parameters would provide the right focus and approach for an organization(Life Sciences BPO vendor) to be in a position to offer a very optimized supply chain.

In summary, thirty two critical success factors were identified. These factors put in a format similar to Table III and when assigned a scale of 1 to 3 (1 for high, 2 for medium and 3 for low) for essentiality can be used as a strategic framework for creating, measuring and assessing Life Sciences centric BPO business models – which are yet to be established, and those already established.

CONCLUSION :

The strategic framework presented in this paper attempts to guide organisations in creating a life sciences centric BPO business model. It presents a series of identified Critical Success Factors (thirty two) which are essential to create this business model.

These have been identified after understanding the life sciences industry and the phenomenon of "global competitiveness" from the Life Sciences BPO Industry context. These "Critical Success Factors" are strategically essential to create and sustain a offshore centric Life Sciences BPO business model.

When weightages are assigned to these identified CSF's we then have a measurement framework, which would help business managers create their own competitive advantage strategy in the offshore, Life Sciences business process outsourcing

industry ecosystem and service global BPO(services) demand of the life sciences industry "to maximize value creation while minimizing costs"..

This strategic framework can also be used as a tool to measure, and provide strategic direction to existing offshore(India) Life Science specific Business Process Outsourcing organisations.

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Exhibit 1 – Developed Critical Success Factors and Source of CSF's

Sl.	Critical Success Factors (CSF)	Source of CSF
1	Physical Infrastructure	STRATEGY
2	Technology	STRATEGY
3	Support Services / Systems	STRATEGY
4	Management Commitment	STRATEGY
5	Organizational Effectiveness	STRATEGY
6	Business flexibility	STRATEGY
7	Partners / Collaborators / Enablers	STRATEGY
8	Corporate ethics	STRATEGY
9	Availability	HUMAN RESOURCES
10	Employability	HUMAN RESOURCES
11	Skills & Attitude	HUMAN RESOURCES
12	Domain Knowledge	HUMAN RESOURCES
13	Trainability	HUMAN RESOURCES
14	HR practices	HUMAN RESOURCES
15	Process Management	OPERATIONS
16	Quality Systems	OPERATIONS
17	Operational Flexibility	OPERATIONS
18	Global Delivery Footprint	OPERATIONS
19	Customer Focused Delivery	OPERATIONS
20	Depth of Services	MARKETING
21	Unique Positioning Advantage	MARKETING
22	Business Flexibility	MARKETING
23	Customer Relationships & Management	MARKETING
24	Sales Force Size & Productivity	MARKETING
25	Sales Force Geographic presence	MARKETING
26	Customer Satisfaction Feedback	MARKETING
27	Investment	FINANCE
28	Access to Capital markets	FINANCE
29	Cost Structure	FINANCE
30	Revenue Stream	FINANCE
31	Cash Flow Management	FINANCE
32	Sustenance	FINANCE
33	Customer focused Practices	FINANCE
34	Political	ENVIRONMENT
35	Economic (Internal to the organization)	ENVIRONMENT
36	Sociocultural	ENVIRONMENT
37	Technological	ENVIRONMENT
38	Global business cycle	ENVIRONMENT
39	Regulatory	ENVIRONMENT
40	Threat of Substitute Products / Services	INDUSTRY
41	Threat of New Entrants	INDUSTRY
42	Competitive Rivalry Within Industry	INDUSTRY
43	Bargaining Power of Buyers	INDUSTRY
44	Bargaining Power of Suppliers	INDUSTRY
45	Bargaining Power of Complementors	INDUSTRY
46	Organizational Innovation	INNOVATION
47	Customer Relationship Innovation	INNOVATION
48	Service Innovation	INNOVATION
49	Operational Innovation	INNOVATION
50	Marketing Innovation	INNOVATION
51	Technological Innovation	INNOVATION
52	Problem Solving Innovation	INNOVATION

Exhibit 2 – Final Instrument – Critical Success Factors and Source of CSF's

Sl.	Critical Success Factors (CSF)	Source of CSF	Measure of Essentiality*					Essentiality (NA)
1	Physical Infrastructure	STRATEGY	1	2	3	4	5	
2	Technology	STRATEGY	1	2	3	4	5	
3	Support Services / Systems	STRATEGY	1	2	3	4	5	
4	Management Commitment	STRATEGY	1	2	3	4	5	
5	Organizational Effectiveness	STRATEGY	1	2	3	4	5	
6	Business flexibility	STRATEGY	1	2	3	4	5	
7	Partners / Collaborators / Enablers	STRATEGY	1	2	3	4	5	
8	Corporate ethics	STRATEGY	1	2	3	4	5	
9	Availability	HUMAN RESOURCES	1	2	3	4	5	
10	Employability	HUMAN RESOURCES	1	2	3	4	5	
11	Skills & Attitude	HUMAN RESOURCES	1	2	3	4	5	
12	Domain Knowledge	HUMAN RESOURCES	1	2	3	4	5	
13	HR practices	HUMAN RESOURCES	1	2	3	4	5	
14	Process Management	OPERATIONS	1	2	3	4	5	
15	Quality Systems	OPERATIONS	1	2	3	4	5	
16	Global Delivery Footprint (Operational Flexibility)	OPERATIONS	1	2	3	4	5	
17	Depth of Services	MARKETING	1	2	3	4	5	
18	Unique Positioning Advantage	MARKETING	1	2	3	4	5	
19	Business Flexibility	MARKETING	1	2	3	4	5	
20	Customer Relationships & Management	MARKETING	1	2	3	4	5	
21	Sales Force Size & Productivity	MARKETING	1	2	3	4	5	
22	Sales Force Geographic presence	MARKETING	1	2	3	4	5	
23	Customer Satisfaction Feedback	MARKETING	1	2	3	4	5	
24	Investment	FINANCE	1	2	3	4	5	
25	Access to Capital markets	FINANCE	1	2	3	4	5	
26	Cost Structure	FINANCE	1	2	3	4	5	
27	Revenue Stream	FINANCE	1	2	3	4	5	
28	Cash Flow Management	FINANCE	1	2	3	4	5	
29	Sustenance	FINANCE	1	2	3	4	5	
30	Customer focused Practices (Pricing Models)	FINANCE	1	2	3	4	5	
31	Political	ENVIRONMENT	1	2	3	4	5	
32	Economic (Internal to the organization)	ENVIRONMENT	1	2	3	4	5	
33	Sociocultural	ENVIRONMENT	1	2	3	4	5	
34	Technolcgical	ENVIRONMENT	1	2	3	4	5	

Sl.	Critical Success Factors (CSF)	Source of CSF	Measure of Essentiality*					Essentiality (NA)
35	Global business cycle	ENVIRONMENT	1	2	3	4	5	
36	Regulatory	ENVIRONMENT	1	2	3	4	5	
37	Threat of Substitute Products / Services	INDUSTRY	1	2	3	4	5	
38	Threat of New Entrants	INDUSTRY	1	2	3	4	5	
39	Competitive Rivalry Within Industry	INDUSTRY	1	2	3	4	5	
40	Bargaining Power of Buyers	INDUSTRY	1	2	3	4	5	
41	Bargaining Power of Suppliers	INDUSTRY	1	2	3	4	5	
42	Bargaining Power of Complementors	INDUSTRY	1	2	3	4	5	
43	Service Innovation	INNOVATION	1	2	3	4	5	
44	Operational Innovation	INNOVATION	1	2	3	4	5	
45	Marketing Innovation	INNOVATION	1	2	3	4	5	
46	Technological Innovation	INNOVATION	1	2	3	4	5	

RELIABILITY OF QUESTIONNAIRE

TITLE:
Questionnaire to Identify Critical Success Factors of Life Sciences Business Process Outsourcing (BPO) Industry.

OBJECTIVE:
Testing the reliability (reliability analysis) of the prepared questionnaire.

METHOD:
The draft questionnaire consisting of 52 questions was sent to 10 respondents. The responses of these respondents were captured. The final response to the questions by all 10 respondents were analyzed / tested for their reliability using the reliability function of SPSS software (ver 17.1.0.).

RESULTS: (RELIABILITY)
After various iterations, and removal of question numbers 13, 17, 19, 46, 47, 52 a Cronbach's Alpha of 0.729 was attained, the results of which are presented below (SPSS OUTPUT).

INFERENCE / DISCUSSION:
As Cronbach's alpha is an coefficient of reliability (or consistency) and determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability, coefficient ranges in value from 0 to 1 may be used to describe the reliability of factors extracted from dichotomous (that is, questions with two possible answers) and/or multi-point formatted questionnaires or scales (i.e., rating scale: 1 = poor, 5 = excellent). Hatcher, L. (1994).

The higher the score, the more reliable the generated scale is. Nunnaly (1978) has indicated 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature.

Since on removal of question numbers 13, 17, 19, 46, 47, 52 would help attain reliability of more than 0.7 (0.729), the specified questions were excluded from Questionnaire version 1.0 to create Questionnaire version 2.0.

SUMMARY :
The final questionnaire incorporating the 46 questions which the respondents responded and which were shown to be reliable have been incorporated into Questionnaire Version 2.0. This questionnaire will be used to conduct the final survey for this study.

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SPSS OUTPUT: (Scale: ALL VARIABLES)

Case Processing Summary

		N	%
Cases	Valid	10	100.0
	Excluded[a]	0	.0
	Total	10	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.729	46

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	205.90	199.433	-.002	.730
Q2	205.90	196.100	.374	.725
Q3	205.80	199.511	.000	.730
Q4	205.90	196.100	.374	.725
Q5	205.80	199.511	.000	.730
Q6	206.50	174.278	.551	.702
Q7	206.00	202.000	-.222	.734
Q8	207.00	214.000	-.312	.770
Q9	206.20	207.511	-.321	.746
Q10	206.10	195.211	.301	.725
Q11	206.20	191.067	.281	.722
Q12	207.20	177.289	.314	.719
Q14	206.40	187.378	.423	.716
Q15	206.70	185.789	.228	.725
Q16	206.50	181.833	.477	.710
Q18	206.60	186.267	.256	.722
Q20	207.20	180.178	.261	.724
Q21	206.70	193.567	.085	.733
Q22	205.90	199.211	.022	.730
Q23	205.90	195.433	.450	.724
Q24	205.80	199.511	.000	.730
Q25	206.30	191.567	.260	.723
Q26	206.00	194.444	.416	.723
Q27	205.90	196.100	.374	.725
Q28	206.30	184.456	.292	.720
Q29	205.90	196.100	.374	.725
Q30	206.50	176.500	.645	.701
Q31	206.70	186.900	.204	.726
Q32	205.80	199.511	.000	.730
Q33	205.90	197.878	.172	.728
Q34	206.20	188.844	.367	.718
Q35	206.10	190.544	.308	.721
Q36	205.90	199.433	-.002	.730
Q37	206.10	190.544	.308	.721
Q38	206.60	171.822	.536	.701

Q39	206.40	180.711	.506	.708
Q40	206.10	190.544	.308	.721
Q41	205.90	196.100	.374	.725
Q42	205.90	196.100	.374	.725
Q43	206.30	193.344	.083	.734
Q44	206.40	198.267	-.028	.741
Q45	205.80	199.511	.000	.730
Q48	206.30	193.344	.083	.734
Q49	205.80	199.511	.000	.730
Q50	206.60	171.822	.536	.701
Q51	206.10	190.544	.308	.721

Critical Success Factors for Life Sciences Business Process Outsourcing

1. DEMOGRAPHIC DETAILS

1. Responses provided will be kept confidential and used for Academic Research purposes only.
2. Names and Contact details will be kept confidential.
3. Thank you for your time and effort in contributing to this academic research project.

*** 1. Please enter your demographic details.**

Name:	
Company:	
Function:	
Education:	
Experience:	
Country:	
Email Address:	

2. Critical Success Factors (CSF) - STRATEGY

*** 2. Please grade these Stratergic parameters for Measure of Essentiality (Least Important to Most Important) and Essentiality of this factor (N/A / Applicable) to affect success of a Life Sciences BPO Organisation Critically.**

	Least Important	Important	Neutral	Very Important	Most Important	N/A
Physical Infrastructure	◯	◯	◯	◯	◯	◯
Technology	◯	◯	◯	◯	◯	◯
Support Services / Systems	◯	◯	◯	◯	◯	◯
Management Commitment	◯	◯	◯	◯	◯	◯
Organizational Effectiveness	◯	◯	◯	◯	◯	◯
Business flexibility	◯	◯	◯	◯	◯	◯
Partners / Collaborators / Enablers	◯	◯	◯	◯	◯	◯
Corporate ethics	◯	◯	◯	◯	◯	◯

Other (please specify)

3. Critical Success Factors (CSF) - HUMAN RESOURCES

*** 3. Please grade these Human resource parameters for Measure of Essentiality (Least Important to Most Important) and Essentiality of this factor (N/A / Applicable) to affect success of a Life Sciences BPO Organisation Critically.**

	Least Important	Important	Neutral	Very Important	Most Important	N/A
Availability	◯	◯	◯	◯	◯	◯
Employability	◯	◯	◯	◯	◯	◯
Skills & Attitude	◯	◯	◯	◯	◯	◯
Domain Knowledge	◯	◯	◯	◯	◯	◯
HR practices	◯	◯	◯	◯	◯	◯

Other (please specify)

4. Critical Success Factors (CSF) - OPERATIONS

*** 4. Please grade these Operational parameters for Measure of Essentiality (Least Important to Most Important) and Essentiality of this factor (N/A / Applicable) to affect success of a Life Sciences BPO Organisation Critically.**

	Least Important	Important	Neutral	Very Important	Most Important	N/A
Process Management	○	○	○	○	○	○
Quality Systems	○	○	○	○	○	○
Operational Flexibility (Customer Focused Delivery)	○	○	○	○	○	○
Global Delivery Footprint	○	○	○	○	○	○

Other (please specify)

5. Critical Success Factors (CSF) - MARKETING

*** 5. Please grade these Marketing parameters for Measure of Essentiality (Least Important to Most Important) and Essentiality of this factor (N/A / Applicable) to affect success of a Life Sciences BPO Organisation Critically.**

	Least Important	Important	Neutral	Very Important	Most Important	N/A
Depth of Services	○	○	○	○	○	○
Unique Positioning Advantage	○	○	○	○	○	○
Business Flexibility	○	○	○	○	○	○
Customer Relationships & Management	○	○	○	○	○	○
Sales Force Size & Productivity	○	○	○	○	○	○
Sales Force Geographic presence	○	○	○	○	○	○
Customer Satisfaction Feedback	○	○	○	○	○	○

Other (please specify)

6. Critical Success Factors (CSF) - FINANCE

*** 6. Please grade these Financial parameters for Measure of Essentiality (Least Important to Most Important) and Essentiality of this factor (N/A / Applicable) to affect success of a Life Sciences BPO Organisation Critically.**

	Least Important	Important	Neutral	Very Important	Most Important	N/A
Investment	◯	◯	◯	◯	◯	◯
Access to Capital markets	◯	◯	◯	◯	◯	◯
Cost Structure	◯	◯	◯	◯	◯	◯
Revenue Stream	◯	◯	◯	◯	◯	◯
Cash Flow Management	◯	◯	◯	◯	◯	◯
Sustenance	◯	◯	◯	◯	◯	◯
Customer focused Practices	◯	◯	◯	◯	◯	◯

Other (*please specify*)

7. Critical Success Factors (CSF) - ENVIRONMENT

*** 7. Please grade these Environmental parameters for Measure of Essentiality (Least Important to Most Important) and Essentiality of this factor (N/A / Applicable) to affect success of a Life Sciences BPO Organisation Critically.**

	Least Important	Important	Neutral	Very Important	Most Important	N/A
Political	◯	◯	◯	◯	◯	◯
Economic (Internal to the organization)	◯	◯	◯	◯	◯	◯
Socio cultural	◯	◯	◯	◯	◯	◯
Technological	◯	◯	◯	◯	◯	◯
Global business cycle	◯	◯	◯	◯	◯	◯
Regulatory	◯	◯	◯	◯	◯	◯

Other (please specify)

8. Critical Success Factors (CSF) - INDUSTRY

*** 8. Please grade these Industy parameters for Measure of Essentiality (Least Important to Most Important) and Essentiality of this factor (N/A / Applicable) to affect success of a Life Sciences BPO Organisation Critically.**

	Least Important	Important	Neutral	Very Important	Most Important	N/A
Threat of Substitute Products / Services	○	○	○	○	○	○
Threat of New Entrants	○	○	○	○	○	○
Competitive Rivalry Within Industry	○	○	○	○	○	○
Bargaining Power of Buyers	○	○	○	○	○	○
Bargaining Power of Suppliers	○	○	○	○	○	○
Bargaining Power of Complementors	○	○	○	○	○	○

Other (please specify)

9. Critical Success Factors (CSF) - INNOVATION

*** 9. Please grade these Innovation parameters for Measure of Essentiality (Least Important to Most Important) and Essentiality of this factor (N/A / Applicable) to affect success of a Life Sciences BPO Organisation Critically.**

	Least Important	Important	Neutral	Very Important	Most Important	N/A
Business Innovation	○	○	○	○	○	○
Service Innovation	○	○	○	○	○	○
Operational Innovation	○	○	○	○	○	○
Marketing Innovation	○	○	○	○	○	○
Technological Innovation	○	○	○	○	○	○

Other (please specify)

Invitation Package

Pre-Invitation E-mail

Subject: Invitation to participate in research study on business models in Life Sciences BPO Industry

Dear [First name Last name],

I am writing to request your help with an important research project being conducted towards reward of a PhD Program awarded by the Aligarh Muslim University. I am conducting a survey study to understand the effect of Business Models on Business Performance. In a few days, you will receive an invitation to participate in the web-based survey.

Today, I would like to give you information about the upcoming survey and explain why we hope you will participate.

The *purpose* of the study is *to better understand business models of the Life Sciences Business Process Outsourcing (BPO) Industry and how it impacts organizational performance outcomes.*

Identifying and understanding Business models is essential for business performance and success in general and specifically for this Industry. We are contacting a random sample of functionaries in the global Life Sciences Outsourcing Industry including Fortune 1000 companies to participate in this study. We believe that you and your organization's experience with outsourcing will be extremely beneficial to this research study.

To give you access to the survey, a web link will be provided in the forthcoming invitation. We assure confidentiality to all participants of the study. Your email address or other personal information will never be associated with your survey responses. *All participants will receive a summary report of the study findings and access to additional industry-specific reports – if so required.*

Thank you for your time and consideration. It is only with the generous help of people like you that our research can be successful.

Sincerely,
C. Omprakash
Research Scholar
Department Of Business Administration
Aligarh Muslim University
Aligarh – UP India.
Email: omprakash_c@yahoo.com

E-mail Invitation

Subject: Invitation to participate in research study on business models in Life Sciences BPO Industry

Dear [First name],
I am writing to request your help with an important research project being conducted towards reward of a PhD Program awarded by the Aligarh Muslim University. I am conducting a survey study to understand the effect of Business Models on Business Performance.

We believe that you and your organization's experience with outsourcing will be extremely beneficial to this research study.

We assure confidentiality to all participants of the study. All participants may request a summary report of the study findings and access to additional industry-specific reports. Your email address or other personal information will never be associated with your survey responses.

Please take the time and complete the questionnaire by following the link below to reach the survey. The survey should take approximately 25-30 minutes to complete.

[Insert secure URL]

If you are not the most suitable person within your organization to participate in this study, please forward this e-mail to the person who should complete the survey and let us know because we would like to contact the person directly in case he or she has any questions. We thank you in advance for your interest and participation in this study.

If you have any questions or concerns at this point or in the future, please feel free to contact me by the e-mail id listed below.

Thank you,
C. Omprakash
Research Scholar
Department Of Business Administration
Aligarh Muslim University
Aligarh – UP India.
Email: omprakash_c@yahoo.com

E-mail Remainder Template

Subject: [Reminder] Invitation to participate in research study on business models in Life Sciences BPO Industry

Dear [First name],

Sometime back, you received an e-mail message requesting your participation in a research study to understand the effect of Business Models on Business Performance. Participating in the study involves completing a web-based survey questionnaire. If you have already completed the survey, please accept our sincere thanks.
If you have not yet had a chance to complete the survey, please take a moment to go to the link listed below and complete the online survey. We are especially grateful for your participation because it is only through executives like you sharing your experiences that we can understand the role business models on Business performance. The survey should take about 25-30 minutes to complete.

[Insert SSL URL]

If you are not the most appropriate person within your organization to participate in this study, please forward this e-mail to the person who should complete the survey and let us know because we would like to contact the person directly in case he or she has any questions.

Thank you, in advance, for your willingness to participate in this study. If you prefer to complete the survey in printed format, please feel free to contact C. Omprakash by any of the means listed below.

Thank you.
C. Omprakash
Research Scholar
Department Of Business Administration
Aligarh Muslim University
Aligarh – UP India.
Email: omprakash_c@yahoo.com

A Questionnaire to Identify Critical Success Factors of Life Sciences Business Process Outsourcing (BPO) Industry.

1. Responses provided in this Questionnaire will be kept confidential and will be used for Research purposes only.
2. Names and Contact details will be kept confidential.
3. **Thank you for your time and effort in contributing to this research project.**
4. For an online version of this survey please follow : http://www.surveymonkey.com/s/WH26MVK

Personal Details

Title	
Name	
Age	Years
Qualification	
Experience	Years
Profession	
E-Mail Address	
Geography / City	

If you are replying on behalf of a group or organization	
Name of Organization	
Position in the Organization	
Address (If different from above)	
E-Mail Address	
Geography / City	

Instructions to complete the Questionnaire

Please use a Black Ball point pen to completely circle (●) your selection and or fill boxes if you are filling the questionnaire on paper.

Sl.	CSF Code	Particulars	Available (Y / N)
1	H3	Required Skills & Attitude Available	
2	M4	Customer Relationships & Management System Exists	
3	O2	Quality Systems Exist	
4	O4	Global Delivery Footprint, Operational Flexibility, Customer Focused Delivery available	
5	N4	Technological Innovation is an ongoing process	
6	S4	Management Commitment is available	
7	H4	Domain Knowledge is available	
8	F7	Customer focused Practices Exist	
9	S5	Organizational Effectiveness Measurement Exist	
10	S8	Corporate ethics applied	
11	N2	Operational Innovation exists	
12	S2	Technology Strategy available	
13	N1	Service Innovation exists	
14	E4	Required Technology available	
15	F5	Cash Flow Management exist	
16	M7	Customer Satisfaction Feedback system in place	
17	M2	Unique Positioning Advantage clear and communicated	
18	S3	Support Services / Systems excellent	
19	E6	Regulatory issue non existant	
20	O1	Process Management system available	
21	S6	Business flexibility applied	
22	F3	Cost Structure flexible	
23	E5	Global business cycle adaptive process available	
24	I4	Bargaining Power of Buyers assessed and managed	
25	N3	Marketing Innovation exists	
26	I1	Threat of Substitute Products / Services exists	
27	M1	Depth of Services available	
28	H2	High Resource Employability	
29	H1	Resource Availability	

Sl.	CSF Code	Particulars	Available (Y / N)
30	E2	Economic (Internal to the organization) stability	
31	F4	Stable Revenue Stream	
32	F6	Financial Sustenance Capability	
33	F1	Investment Capability	
34	F2	Access to Capital markets Available	
35	M3	Business flexibility applied	
36	I6	Bargaining Power of Complementors measured and managed	
37	M5	Sales Force Size & Productivity high	
38	M6	Sales Force Geographic presence high	
39	I3	Competitive Rivalry Within Industry high	
40	S1	Physical Infrastructure available	
41	H5	HR practices exist and are progressive	
42	S7	Partners / Collaborators / Enablers available and active	
43	I2	Threat of New Entrants high	
44	E3	Socio cultural activities	
45	I5	Bargaining Power of Suppliers high	
46	E1	Political Influence high	

Thank you for your Time and Effort !

Figure 4.5- Respondents geographic profile

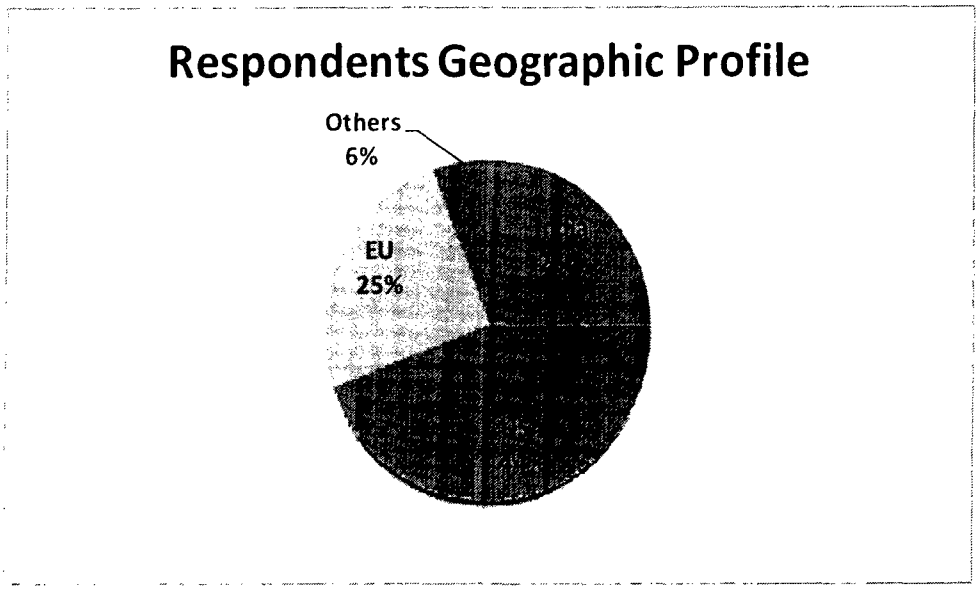

Figure 4.6- Respondents business profile

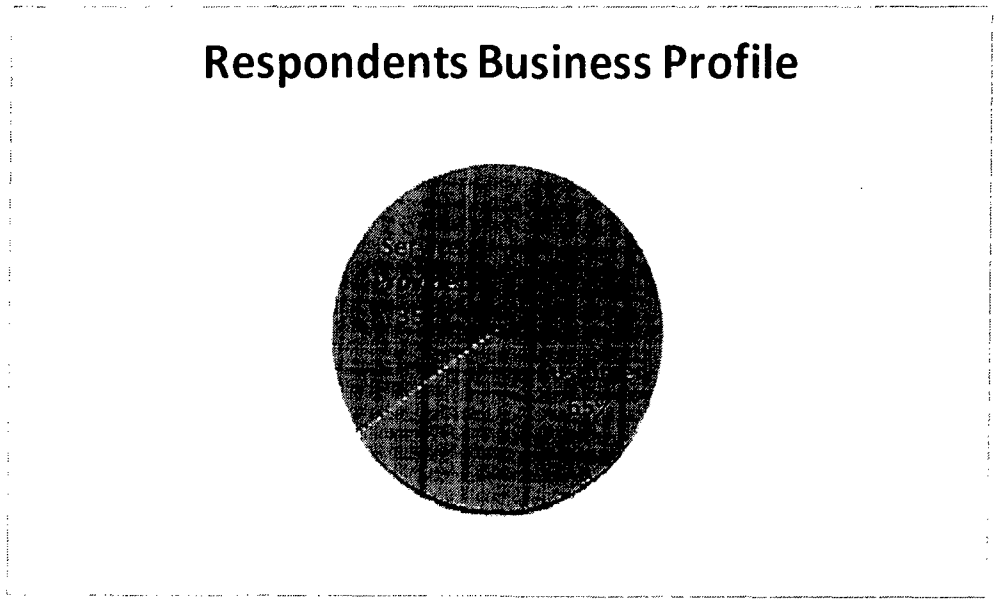

Figure 4.7- Respondents business activity profile

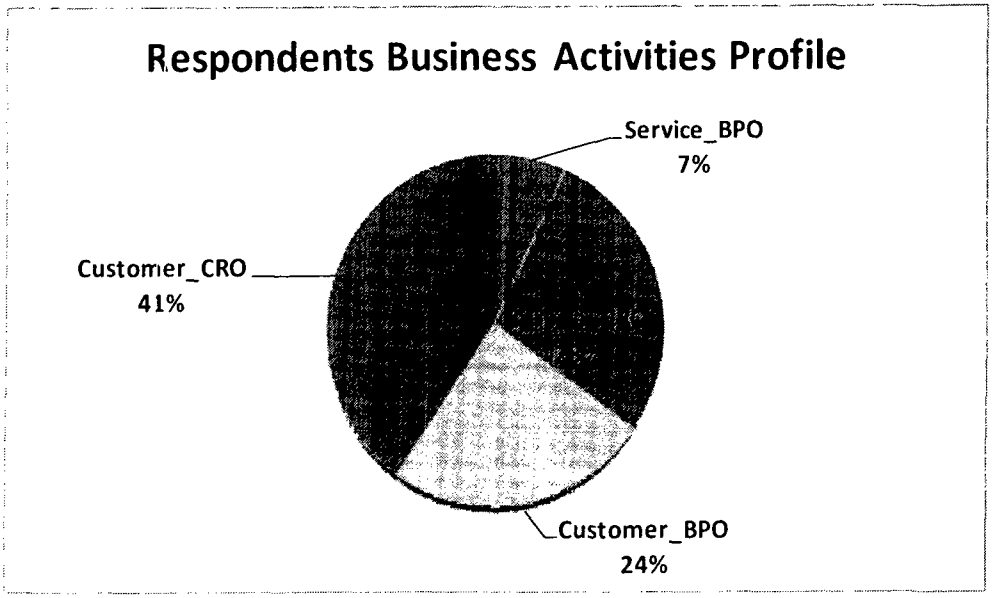

Figure 4.8- Respondents organisation hierarchy profile

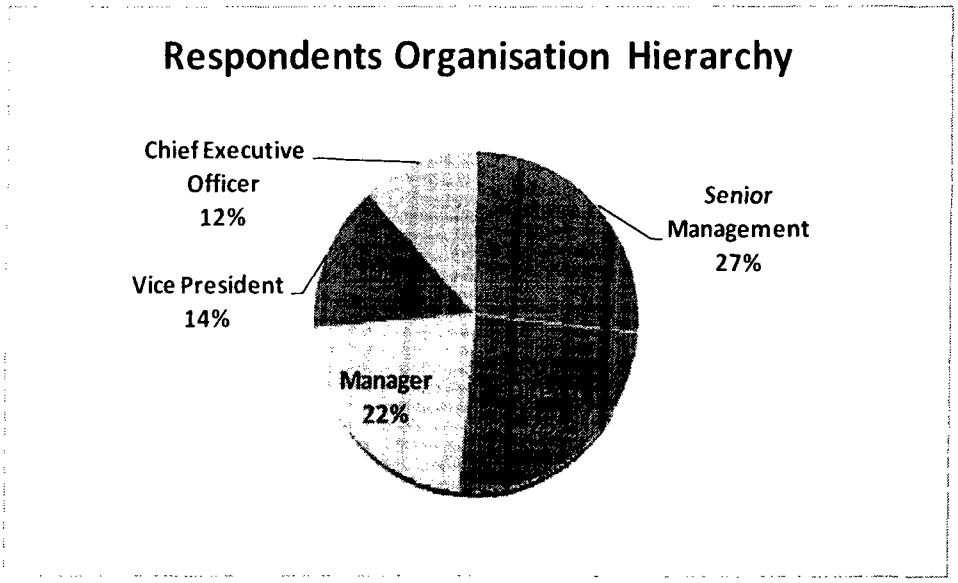

Figure 4.9- Respondents organisation roles profile

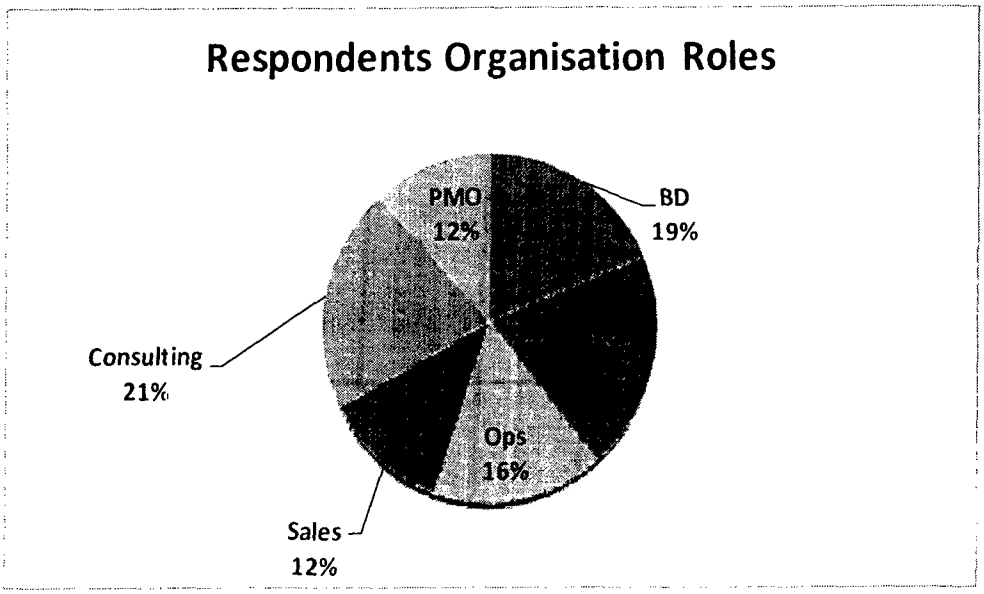

Figure 4.10- Respondents industry profile

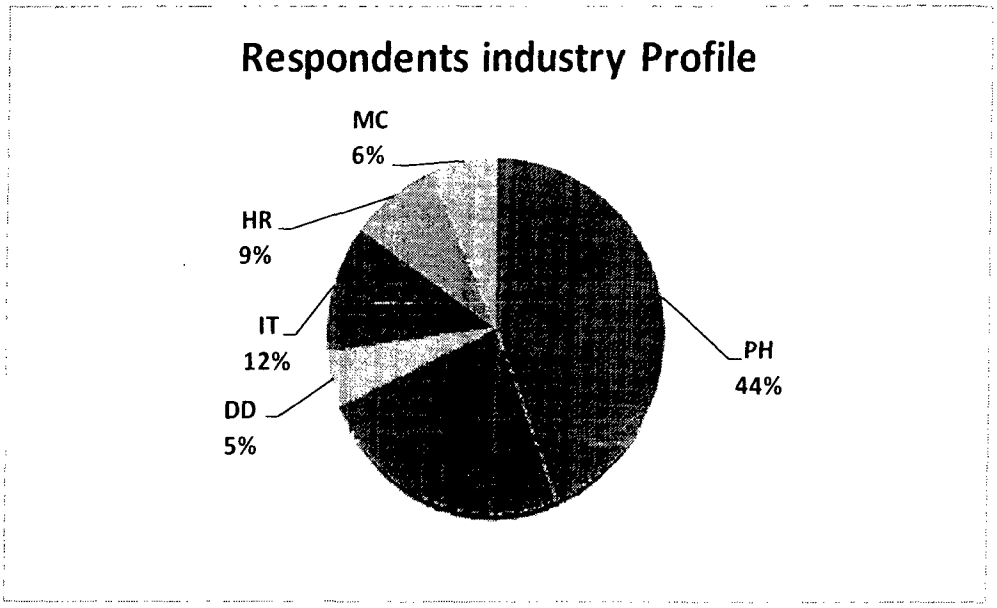

Figure 4.11- Comparative Analysis – Respondents industry profile (India)

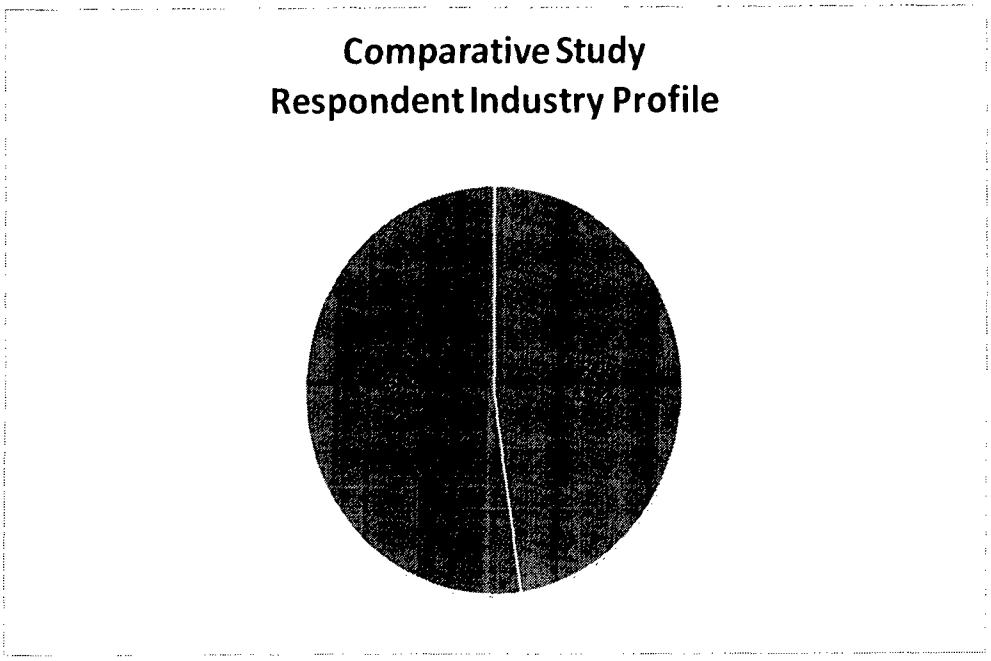

Figure 4.12- Strategic CSF – Average ranking by degree of importance

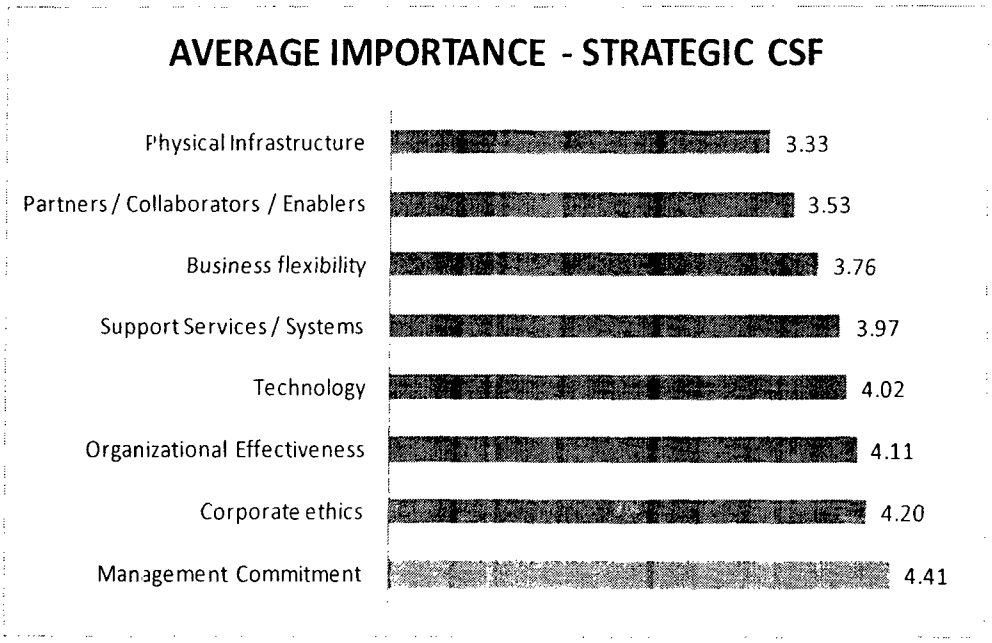

Figure 4.13- Human Resources CSF – Average ranking by degree of importance

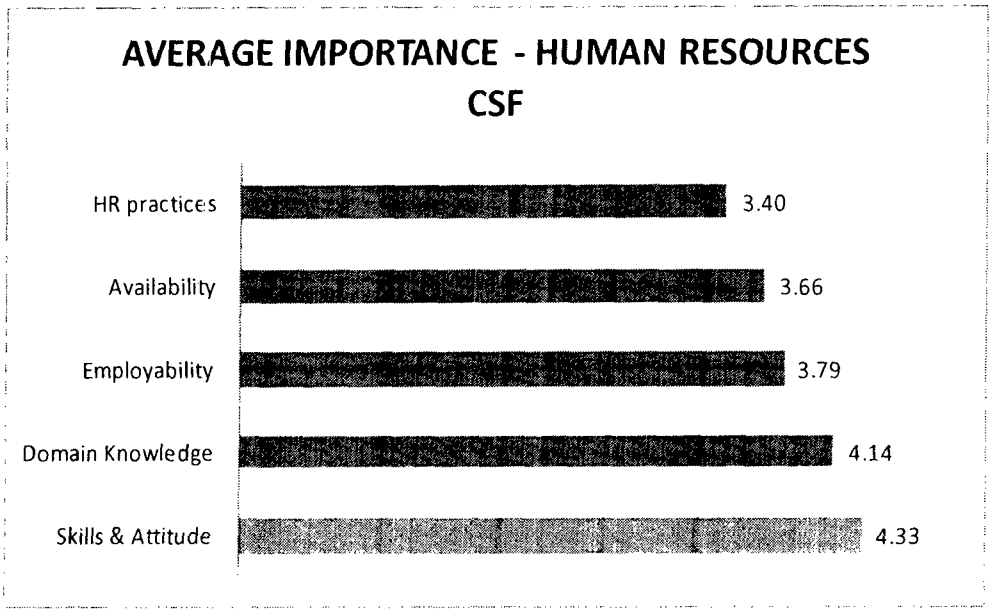

Figure 4.14- Operations CSF – Average ranking by degree of importance

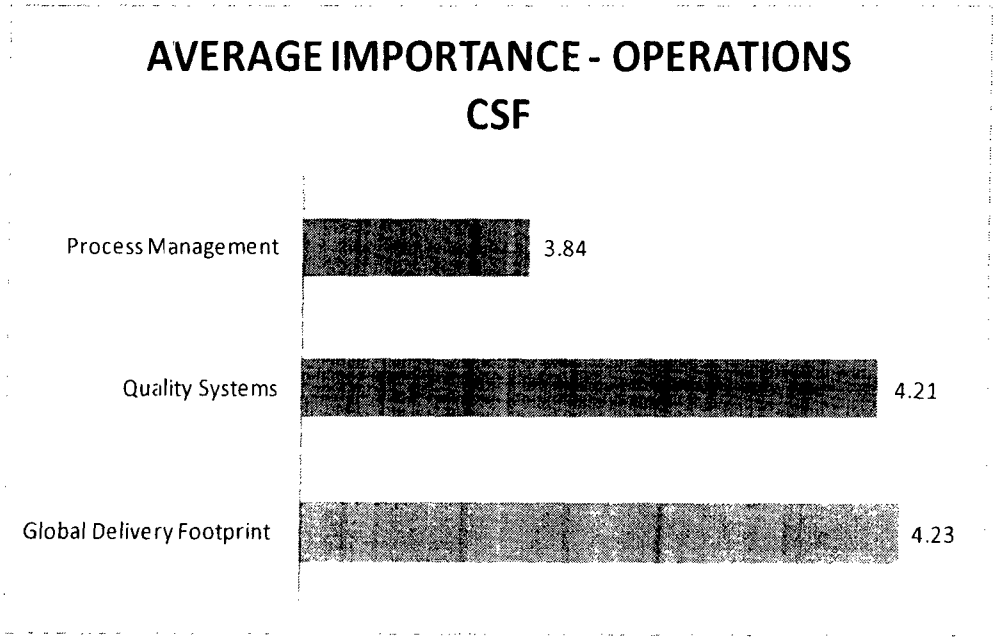

Figure 4.15- Marketing CSF – Average ranking by degree of importance

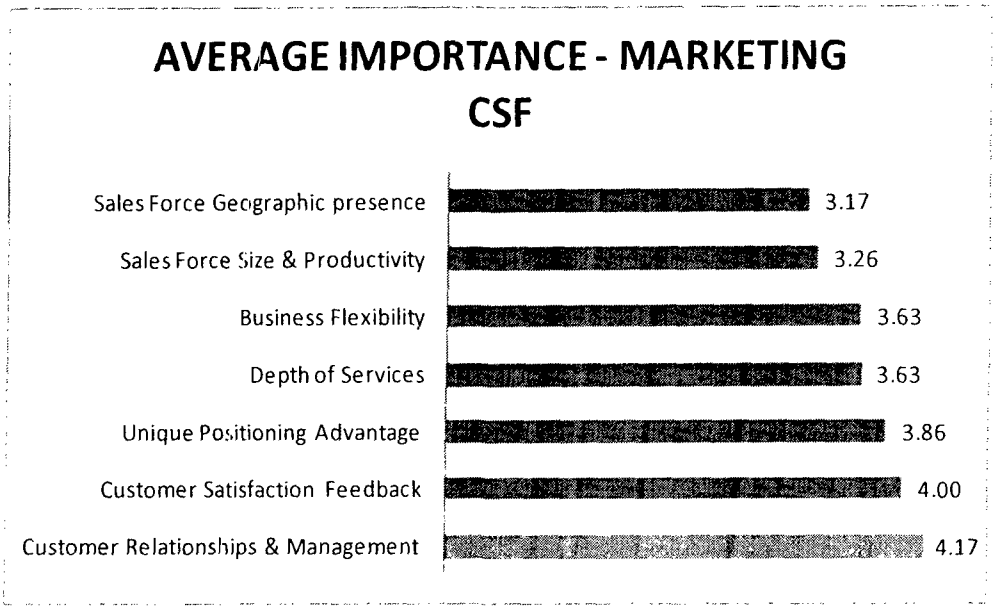

Figure 4.16- Finance CSF – Average ranking by degree of importance

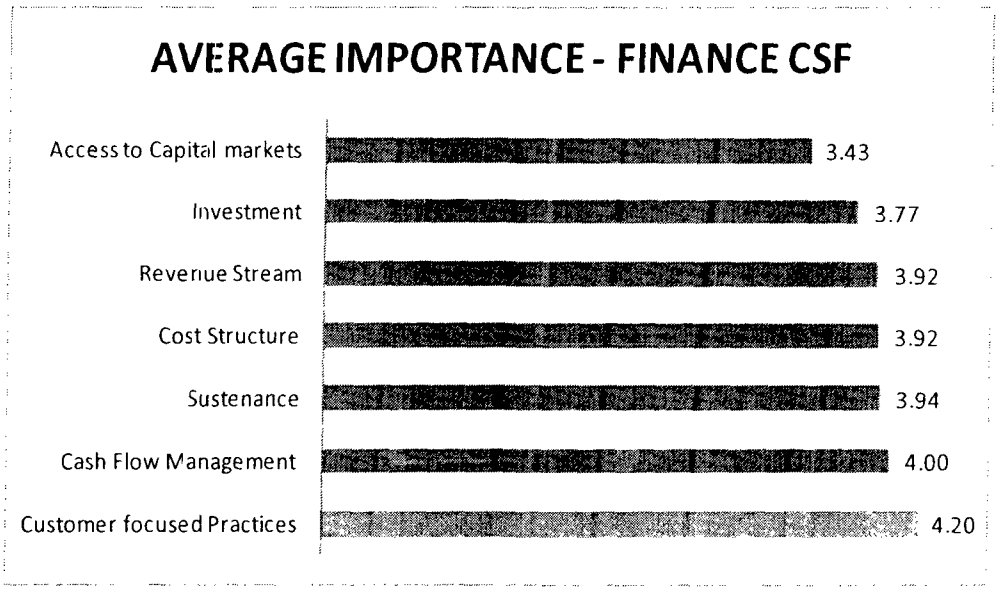

Figure 4.17- Environment CSF – Average ranking by degree of importance

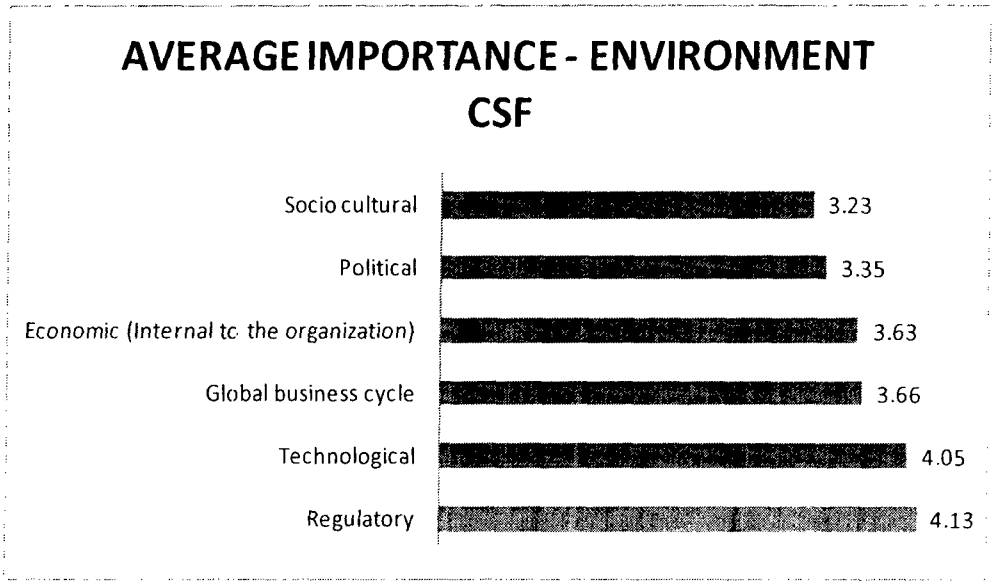

Figure 4.18- Industry CSF – Average ranking by degree of importance

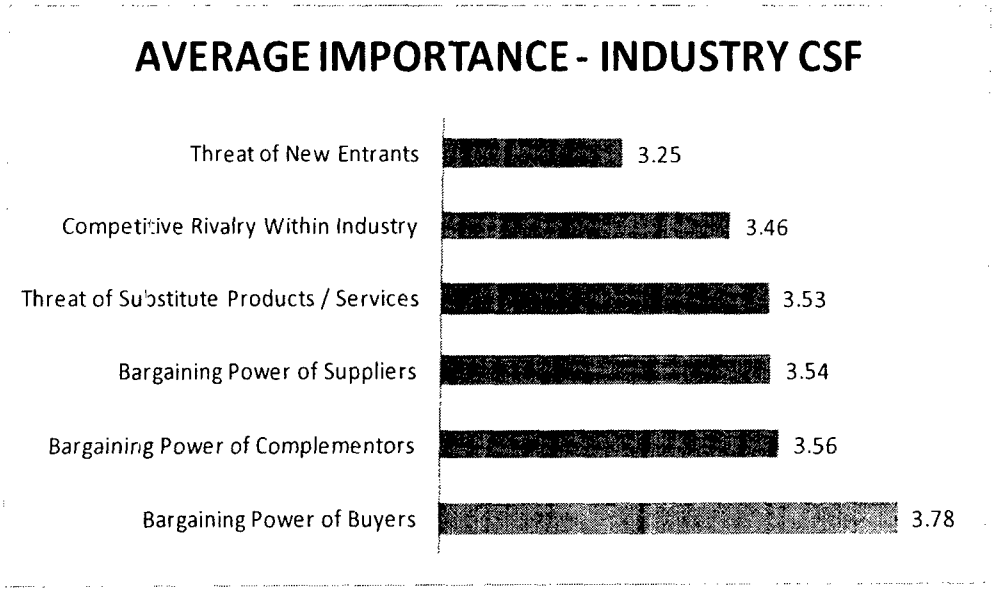

Figure 4.19- Innovation CSF – Average ranking by degree of importance

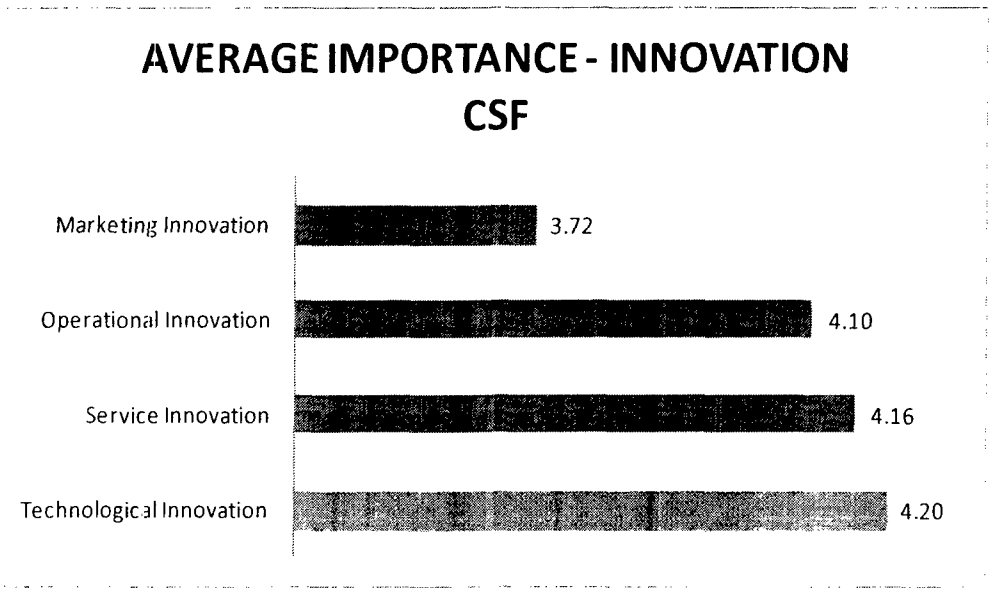

Figure 4.20- Grouping of CSF themes based on their averages